BUY-BACKS: AN EMPIRICAL INVESTIGATION ON STOCK REPURCHASES

By

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BUY-BACKS: AN EMPIRICAL INVESTIGATION ON STOCK REPURCHASES

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The signalling and free cash flow/overinvestment explanations of the impact of stock repurchases on the average abnormal returns of a repurchasing firm's common stock are analyzed. The free cash flow/overinvestment hypothesis and accompanying stock price response are analyzed by partitioning the sample into three groups based on the source of the firm's free cash flow. A direct test of the signalling hypothesis is conducted by examining the association between the firm's daily risk-adjusted return and two proxies of the strength of the repurchase signal -- the percent of equity repurchased and the tender offer premium. Rational expectations and sample selection biases are also analyzed and tested.

Support for the free cash flow/overinvestment hypothesis is found. The signalling hypothesis is not supported by the results of this study.

CHAPTER 1
INTRODUCTION

The resurgence of stock buy-backs during the past decade has awakened academic interest in the reasons behind a firm's repurchase of its common stock. For example, on January 3, 1989, the Wall Street Journal reported that the value of the twenty largest buy-backs announced in 1988 amounted to over $23 billion. Eleven of these twenty firms (55%) reported that the buy-back would be financed solely by internal cash flow or funds on hand. The average percent of shares announced to be repurchased by these top twenty firms was 15.9%, ranging from 3% by IBM to 63% by UAL Corporation. Clearly, stock repurchasing is a significant event in some U.S. corporations.

An investigation into the motives behind stock repurchases is the primary objective of this study. The most frequently cited motives behind stock buy-backs are these: 1. The Bondholder Wealth Expropriation Hypothesis; 2. The Tax Hypothesis; 3. The Leverage Hypothesis; 4. The Managerial Incentive Hypothesis; and 5. The Signalling (or Information) Hypothesis. Each hypothesis is discussed in detail in the next chapter. Recent attention, however, has focused on the use of self-tender offers as credible signals (see Ofer and Thakor [1987], Comment and Jarrell [1989], Vermaelen [1981], Dann [1981], and Masulis [1980]); the increased use of dutch auctions in self-tender offers (see Comment and Jarrell [1989]); and the growth in stock buy-backs after the market crash in October 1987 (see Comment and Jarrell [1989] and Netter and Mitchell [1989]).

Stock repurchasing, however, is a complex phenomenon apparently motivated by many factors. Currently, the most popular hypothesis is the signalling hypothesis which views stock repurchasing as a way to disseminate "favorable" asymmetric information to investors. For example, if management possesses information which investors are not aware of regarding the future profitability of the firm's investments, then this hypothesis asserts that a stock buy-back will serve as a signal to investors that the stock is undervalued (see Dann [1981], Vermaelen [1981], Masulis [1980], Comment and Jarrell [1989], among others).

Alternatively, however, it can be argued that a stock repurchase is in response to the "lack" of profitable investment opportunities; that is, the lack of positive marginal net present value (NPV) projects. The theoretical motive for stock repurchases due to the lack of profitable investment opportunities is well documented in the literature (see Woods and Brigham [1966], Young [1967] and Ben-Horim and Levy [1988]). This is also consistent with Jensen's [1986] concept of free cash flow which he defines as:

> cash flow in excess of that required to fund all investment projects with positive net present

> values when discounted at the relevant cost of capital.[1]

This appears to have some empirical support since eleven of top twenty firms announcing a stock buy-back in 1988 announced that the repurchase would be financed solely by internal cash flow.

The objective of this study is to investigate two competing explanations on the motives behind stock buy-backs -- signalling versus free cash flow. A survey of the literature on stock repurchasing is presented in Chapter 2. The data, sample selection, and a discussion of various empirical models are provided in Chapter 3. The hypotheses and methodology employed to test the free cash flow hypothesis are presented in Chapter 4. Chapter 5 presents the hypotheses and methodology employed to directly test the signalling hypothesis. The empirical results are reported in Chapter 6. Chapter 7 investigates rational expectations and sample selection biases, and includes the results of a test of rational expectations. An individual analysis of a few of the firms included in the sample is presented and discussed in Chapter 8. Concluding remarks are presented in Chapter 9.

Note

1. See Jensen [1986], page 323.

CHAPTER 2
LITERATURE REVIEW

Competing Hypotheses

Several explanations have been advocated in the existing literature on the possible motives behind a firm's repurchase of its common stock. The most frequently cited are these:

1. Bondholder Wealth Expropriation Hypothesis. This hypothesis maintains that a stock repurchase represents a transfer of wealth from a company's bondholders to its stockholders. Since a stock repurchase may reduce the assets of the firm, the value of the claims of bondholders can potentially be reduced. If this expropriation of assets is not anticipated by bondholders, then wealth may be transferred from bondholders to stockholders (see Galai and Masulis [1976]). Because of the increasing existence of bond covenants and legal restrictions mandating that common stock repurchases must be made out of surplus or earned surplus accounts, this hypothesis is difficult to support. Masulis [1980] reports that of the 163 tender offers analyzed in his sample, eighty percent of the firms had bond covenants (as reported in the firm's exchange offer prospectus) protecting bondholders from potential wealth transfers. Dann [1981] also finds that no class of claimants is harmed through a reduction

in the value of their claims as a result of a stock repurchase.

2. Tax Hypothesis. This hypothesis views a stock repurchase as an alternative to a dividend payment. One of the earliest articles advocating the tax hypothesis is by Bierman and West [1966]. They analyze stock repurchases versus cash dividend payments, and conclude that the tax advantage of buy-backs is the only theoretically viable motive for the use of share repurchases as a method of cash disbursement. In a world with a preferential capital gains tax rate, this hypothesis states that a stock repurchase versus a dividend payment generally results in a lower tax burden for its stockholders.[1] The tax benefit occurs because a stock repurchase (tendered stock) may qualify for taxation at the capital gains tax rate, whereas dividend payments are taxed as ordinary income.[2]

With repeal of the preferential capital gains tax rate in 1986, the tax advantage of capital gains is reduced; while capital gains still bear some value arising from the ability to defer taxation of the gain, its value has clearly diminished. In addition, Miller and Scholes [1978] argue that investors may be able to offset personal tax liabilities associated with the payment of dividends, and thus they argue against this hypothesis.

3. Managerial Incentive Hypothesis. Many corporations offer their key executives stock options as part of their

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compensation package. The managerial incentive hypothesis contends that executive stock option plans are a prime motive behind a stock repurchase. This hypothesis asserts that managerial compensation is affected by the perceived value of the information signalled to the market by a stock repurchase. Vermaelen [1984] and Ofer and Thakor [1987] develop a link between stock repurchases and managerial incentive programs. Vermaelen [1984] reports that

> (i) repurchase tender offers convey inside information, (ii) perceived managerial benefits are positive and significant, and (iii) managerial incentives related to preventing take-over bids and executive stock options are taken into account by the market when it prices securities after the repurchase announcement.[3]

This hypothesis can be viewed as a subset of the information or signalling hypothesis investigated in this study and discussed below.

4. Leverage Hypothesis. This hypothesis maintains that if a stock repurchase is financed by debt versus cash surplus or internal funds, then the price of the stock will rise due to the tax deductibility of the interest payments. There is, of course, considerable controversy regarding the value of the tax-subsidy of debt (see Modigliani and Miller [1958, 1963] and Miller [1977]). Masulis [1980] also finds evidence which he concludes supports the tax effect argument in his study on intrafirm debt-equity exchanges.[4]

5. Signalling (or Information) Hypothesis. Under this hypothesis, repurchasing is viewed as a method used by

management to disseminate favorable asymmetric information to investors. If the agent (management) possesses future information which is currently unknown to the principal (stockholders), then this hypothesis asserts that a share repurchase serves as a way to disseminate this asymmetric information. This hypothesis is currently the most popular explanation for stock repurchases.

An explanation challenging the signalling hypothesis is the free cash flow or overinvestment motive. Empirically examining the free cash flow explanation in relation to stock repurchases and directly testing the signalling explanation are the primary objectives of this study. A more extensive discussion of the signalling and free cash flow hypotheses is presented in the following section.

Signalling versus Free Cash Flow/Overinvestment

There are three basic ways in which a firm can reacquire its common stock: through a private negotiation, via a repurchase in the open market, or by a self-tender offer. A private negotiation may, for example, consist of a firm buying the shares held by the surviving heirs of a deceased board member or previous founder, or may entail buying the shares of small shareholders in order to reduce the administrative costs in handling these small accounts. The dollar value of private negotiation repurchases is usually small.

In an open market purchase, the firm instructs its broker to periodically repurchase shares of its common stock on the open market just like an outside investor would purchase the stock. In an open market purchase, the firm buys its stock at the price prevailing in the market at the time the shares are purchased. While companies typically announce that they will be repurchasing some of their stock from time to time in the open market over the next year or two, the exact date, quantity, and of course price associated with the repurchase are not disclosed. These repurchases are made at the discretion of the manager and may be made on a daily basis.

Unlike open market purchases, self-tender offers represent a more formal way for a firm to reacquire its stock. With a self-tender offer, shareholders are formally notified of the firm's intent to buy-back some of its stock. Self-tender offers can either be in the form of a fixed price offer or a dutch auction. The term "self-tender offer" is used to denote that a firm is buying back its own stock (versus buying the stock of another company). In a fixed price tender offer, the firm announces both the number of shares it plans to repurchase as well as the price it will pay for each share tendered.[5] In a dutch auction, the firm announces the number of shares it wants to repurchase as well as the minimum and maximum price it is willing to pay for each share of stock.[6] Shareholders then submit "bids" to the firm specifying both the number of shares and price at which they are willing to

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tender their shares. The firm then determines, based on the bids received, the price it will pay and the actual number of shares it will repurchase. The tender offer price is usually established at a premium in relation to the current market price of the stock regardless of the method used. The tender offer typically remains in effect for three to four weeks from the day of the repurchase announcement.

The most frequently cited studies of the signalling explanation in connection with stock repurchases is Dann [1981] and Vermaelen [1981]. Vermaelen [1981] analyzes both open market repurchases and self-tender offers between 1962 and 1977.[7] He uses cumulative average residual (denoted CAR) methodology from sixty days prior to the repurchase announcement to sixty days after the announcement to analyze the 131 self-tender offers in his sample.[8] In the case of tender offers, he finds that prior to the announcement (where the day of the announcement is denoted t = 0), the cumulative average residuals were not statistically different from zero. At t = -4, the cumulative average residuals begin to increase, increasing at t = -4,

t = -2, t = -1, t = 0 and t = +1. From t = -2 to t = +1, the CAR's increase from 2.14% to 17.36%.[9] After t = +1, the CAR's remain relatively constant until t = +19 when they begin to decline; at t = +60 the CAR is 13.34%. Vermaelen argues that his findings support the explanation that the repurchasing firm's stock was undervalued prior to the tender offer since the gain of 13.34% remains even sixty days after the tender offer announcement.

Vermaelen's findings in connection with his study of open market repurchases, however, do not conform to the signalling hypothesis. He finds that open market purchases are preceded by a period of abnormal negative price performance in the three months prior to the repurchase announcement. He documents a 7% negative abnormal residual and concludes that this negative performance merely suggests that a good "control" period was not selected. In nineteen out of the twenty-five days prior to the open market repurchase announcements, Vermaelen finds that the average residual is negative, and that the CAR's are negative at least from t = -25 to t = +25 (which is the earliest and latest residual he reports). This negative price performance is, of course, inconsistent with the signalling hypothesis since the stock price after the repurchase announcement remains below the preannouncement price. This study argues that these results may be consistent, however, with the free cash flow/over-investment hypothesis.

Another proponent of the signalling hypothesis, Dann [1981], examines the effect of stock repurchases on a firm's equity, debt, and preferred stock. Using mean-adjusted returns rather than risk-adjusted or market returns, he documents a two day mean rate of return on equity of 15.41%. His sample consists of 143 self-tender offers announced between 1962 and 1976. He also finds that the increase in the stock price is sustained for up to 60 days after the repurchase announcement, and concludes that the increase in value by repurchasing firms is due principally to an informational signal.

If one takes a closer look at Dann's [1981] sample some interesting results are revealed. First, from t = -20 to t = -1, the mean rate of return is negative in ten out of nineteen days; furthermore, for fourteen days (73%!), more firms report negative rates of return. Next, even at t = 0, where one would expect the rate of return to be positive for all firms if the signalling explanation is confirmed, 17 out of the 138 firms in the sample report a negative rate of return.

In a more recent article, Comment and Jarrell [1989] analyze stock repurchases by investigating the difference between fixed price versus dutch auction tender offers. They report an average seven-day announcement return of 7.5% in all dutch auction offers, and an average return of 9.4% for fixed price offers. They conclude that the signalling theory is supported by their findings, and that the signal conveyed by a stock repurchase is more credible for fixed price offers than offers made via a dutch auction.

An alternative explanation for stock repurchasing is investigated in this study -- the free cash flow/overinvestment hypothesis. The free cash flow/overinvestment hypothesis views stock repurchasing as a response to the firm's "lack" of profitable investment opportunities (that is, the lack of positive marginal NPV projects), and the accumulation of free cash flow arising from an event occurring in the past. In contrast, the signalling explanation views stock repurchasing as a response to the lack of knowledge by investors (asymmetric information) of the firm's future "profitable" investment opportunities.

The free cash flow/overinvestment explanation investigated in this study is consistent with Jensen's [1986] concept of free cash flow. Jensen defines free cash flow as

> cash flow in excess of that required to fund all investment projects with positive net present values when discounted at the relevant cost of capital.[10]

Jensen points out that, due to the likelihood that a firm will incur monitoring by the capital markets if new capital must be raised, managers have an incentive to expand a firm beyond its optimal size (i.e., overinvest). The more free cash flow generated by the firm, the more likely it is that the firm will overinvest, and thus the more severe the conflict between managers and shareholders over the payout of the excess cash. The empirical implication of the free cash flow explanation is that the stock price will rise when management unexpectedly increases shareholder wealth by paying out the free cash flow generated by the firm rather than overinvesting.[11] In Chapter 7 the implications of the tendency of firms with free cash flow to overinvest in a rational expectations equilibrium is discussed and tested.

A firm possessing free cash flow can either increase its cash dividend, repurchase some of its stock, or overinvest by accepting negative marginal NPV projects. Lang and Litzenberger [1989] investigate the free cash flow/overinvestment explanation in relation to cash dividend announcements. They examine the impact on the risk-adjusted returns of 429 dividend change announcements made between 1979 and 1984. The free cash flow hypothesis predicts that the stock price will rise when a firm increases its cash dividend if the cash dividend increase reduces the extent of overinvestment by the firm. To capture the degree of overinvestment by firms in their sample, Lang and Litzenberger [1989] use an estimate of Tobin's Q ratio to stratify their sample. Tobin's Q is the ratio of the market value of the firm's equity and debt (market value of the firm) to the replacement cost of its assets. In proposition 1, Lang and Litzenberger [1989] show that an average ratio greater than unity is a necessary condition for a firm to be at a value maximizing level of investment. Likewise, they show in proposition 2 that an average Q ratio less than unity is a sufficient condition for a firm to be overinvesting. Therefore, they stratify their sample by designating those firms with Q less than unity to be overinvesting firms.[12] By using Tobin's Q as a measure of the intensity of overinvestment, Lang and Litzenberger [1989] find evidence supporting the free cash flow explanation. They conclude that the empirical results are consistent with the explanation that dividend changes by overinvesting firms inform stockholders of the firm's investment policy rather than serving as a signal of positive asymmetric information.

Ben-Horim and Levy [1988] formally model the relationship between the source of the firm's free cash flow and stock repurchasing. For simplicity only, assume an all equity firm with constant returns to scale and an increasing marginal cost of capital (MCC).[13] The firm's expansion curve, which shows the relationship between the price of the stock and number of shares outstanding for a given expected rate of return on investment (IRR) and marginal cost of capital (MCC), is bell-shaped (see Figure 1).[14] As shown in the top panel of Figure 1, the optimal level of investment is at the point of intersection between the IRR and MCC curves; that is, at the point where the stock price is maximized.

Suppose that the firm initially starts on IRR_1 (see Figure 1).[15] The optimal level of investment is at point A, where the MCC is equal to the IRR on the marginal dollar invested. Point A' in the bottom panel of Figure 1 lies on expansion curve p_1 where the stock price is maximized. If the manager overinvests rather than distributing the free cash flow to shareholders, the value of the firm will be at some point to the right of point A', such as point C, on p_1. At this point, value is not maximized.

Free cash flow may be generated from an inward shift of a firm's investment opportunity frontier. Two events may trigger an inward shift of the firm's investment curve: 1) A mean-preserving change in the risk of the firm's investments (leftward shift of the MCC curve); or 2) A risk-preserving change in the mean rate of return on investment (a downward shift of the IRR curve). Figure 1 shows that a decrease in the mean return on the firm's investments, holding risk constant, leads to a decline in the price of the stock for any given level of investment and number of shares outstanding. This decrease in the rate of return on investments can be characterized by a downward shift in the firm's IRR curve from IRR_1 to IRR_2 in the top panel of Figure 1. This shift defines a new price expansion curve, p_2 in the lower panel of Figure 1. As shown, the stock price falls from A' to B'' on the new expansion curve p_2. Since at this point the number of shares outstanding is unchanged, the value of the firm at B'' is lower than the value at A' and the firm is employing too much capital. In order to maximize the firm's stock price, and hence value, the firm should repurchase $(n_A - n_B)$ shares of stock.[16] This increases the firm's stock price from B'' to B', where the stock price is maximized. If investors observe the shift in the firm's investment curve and correctly anticipate the firm's contraction by buying back $(n_A - n_B)$ shares of stock, then the stock price should immediately fall from A' to B', and the 15% two day abnormal return reported by Dann

[1981] and others should not be observed. Given agency costs between shareholders and management, however, the stock price may decrease anywhere from A' to B''. In a rational expectations equilibrium, one expects that on average investors will correctly anticipate the level of contraction (and hence overinvestment) by firms experiencing a downward shift of its investment curve, and hence no announcement effect is expected. However, a selection bias exists in any empirical study of stock repurchasing. The bias arises when all firms which experience an inward shift of their investment curve are not included in the sample. Firms which should contract but do not are not analyzed. Therefore, the positive announcement effect associated with stock repurchasing may be attributed to this sample selection bias (see Chapter 7).[17]

Alternatively, it can be shown that if the riskiness of a firm increases, the firm may undertake a stock repurchase in order to maximize firm value. Assuming that the expected rate of return on investment remains constant, an increase in risk increases the MCC; that is, the MCC curve shifts from MCC_1 to MCC_2 (see Figure 2). The value of the firm's investments decrease causing the expansion curve to shift from p_1 to p_2. Note that this is completely analogous to the risk-preserving decrease in the expected rate of return discussed above -- that is, the stock price falls from A' to B'' and the firm should respond by repurchase $(n_A - n_B)$ shares of stock.

Both the risk-preserving decrease in the mean rate of

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return on investment as well as the mean-preserving increase in risk are termed "unfavorable" events in this study. A firm's accumulation of free cash flow, however, may also arise from the occurrence of a "favorable" event. For example, assume the firm receives a one time unexpected return on investment of G depicted graphically in Figure 3. The MCC and IRR curves do not shift, but the value of the firm increases to V^* + G. In order to maximize value and retain the optimal level of investment I^*, the firm should distribute G to stockholders either by repurchasing some of its stock or by paying an extra cash dividend. If exactly G is distributed to shareholders, the firm will have fewer shares outstanding, but the value of the firm will remain at V^*.

The theoretical model developed by Ben-Horim and Levy [1988] and the unexpected extra cash flow discussed above, formally captures the source of a firm's free cash flow described by Jensen [1986].[18] Lang and Litzenberger [1989] find support for the free cash flow explanation in their study of cash dividend announcements. Empirical research into the free cash flow/overinvestment explanation in relation to stock repurchasing, however, is lacking. The objective of this study is to correct this deficiency and to directly test a competing explanation for repurchases -- the signalling hypothesis.

Notes

1. Section 302 of the Internal Revenue Code defines the terms under which a stock repurchase qualifies for capital gains tax treatment. Also, see Dann [1981] for a discussion of this issue.

2. This hypothesis can be interpreted as implicitly assuming that stockholders do not tender all of their holdings in the firm. Also, Elton and Gruber [1968] show that with the imposition of transactions costs, the tax advantage found by Bierman and West [1966] vanishes.

3. See Vermaelen [1984], page 66.

4. A stock repurchase may also be the most cost efficient method of realigning a firm's capital structure. For example, if the stock price increases and hence its debt to equity ratio is falls, a firm may repurchase its stock in order to reestablish its optimal debt-to-equity ratio.

5. Also published in the tender offer circular are such things as the expiration date of the offer, any restrictions on the participation of management in the offer, how the repurchase will be financed, the procedure for oversubscribed or undersubscribed offers, etc.

6. The Securities and Exchange Commission requires that a minimum and maximum tender offer price be established by the firm at the time the dutch auction is announced.

7. While information on open market purchases is a matter of public record, it could not be reasonably obtained from the Securities and Exchange Commission for this study.

8. CAR methodology is discussed in Chapter 3 and 4.

9. Interestingly, the largest average abnormal return (denoted AR) of 8.89% occurs at $t = -1$; that is, one day prior to the defined announcement day. In Chapter 3, in the section entitled "Data and Sample Selection" a discussion of the sources of the announcement dates and the discrepancies encountered between reporting sources is discussed.

10. See Jensen [1986], page 323.

11. It follows, therefore, that as the amount of free cash flow distributed to shareholders increases, the more the stock price will rise. When management distributes all of the firm's free cash flow the theory predicts the stock price will be maximized (where it is assumed that maximizing stock price is equivalent to maximizing shareholder wealth).

12. There are, of course, technical problems associated with the use of Tobin's Q. For example, determining the market value of a firm's debt when the debt is thinly traded, or quantifying the replacement value of a firm's assets is not easily determined. Recall, however, that Tobin's Q is only a proxy of the extent of a firm's overinvestment. In the current study, the source of the firm's free cash flow is used to stratify the sample.

13. Since existing shareholder wealth is being maximized, assuming either decreasing returns to scale and an increasing MCC curve; or decreasing returns to scale and a horizontal MCC curve; or constant returns to scale and an increasing MCC curve does not alter the results or general shape of the expansion curve. If both constant returns to scale and a flat MCC curve are assumed, then the optimal production point is, of course, no longer unambiguous.

In Figures 1 and 2, the rate of return on investment is denoted IRR and the marginal cost of capital by MCC. μ is defined as the average cost of capital.

14. The concavity of the expansion curve arises from the maximization of existing shareholders' wealth; that is, the current price of the stock reflects its full value and hence new shareholders incur no gain.

Also, the initial number of shares is arbitrary. The relationship between the initial number of shares outstanding versus the ending number of shares is analyzed.

15. Where the investment curve defines the relationship between the value of the firm's investments and the expected marginal rate of return.

16. The model is set in a value maximizing framework where it is assumed that existing shareholder's wealth is maximized; hence, maximizing the firm's stock price is equivalent to maximizing the value of the firm.

17. The magnitude of the drop in price does, of course, depend on the extent of these agency costs; the stock price may fall anywhere between A' and B''.

18. The model developed by Ben-Horim and Levy [1988] also analyzes the effect of a risk preserving increase in the mean rate of return on investment as well as a decrease in the

riskiness of the firm. Both of these events imply that the firm should raise new equity capital in order to maximize firm value.

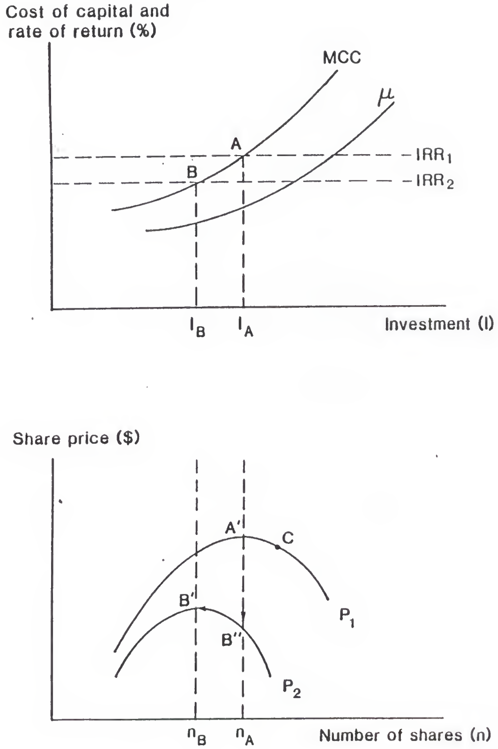

FIGURE 1

RISK-PRESERVING DECREASE IN MEAN RATE-OF-RETURN

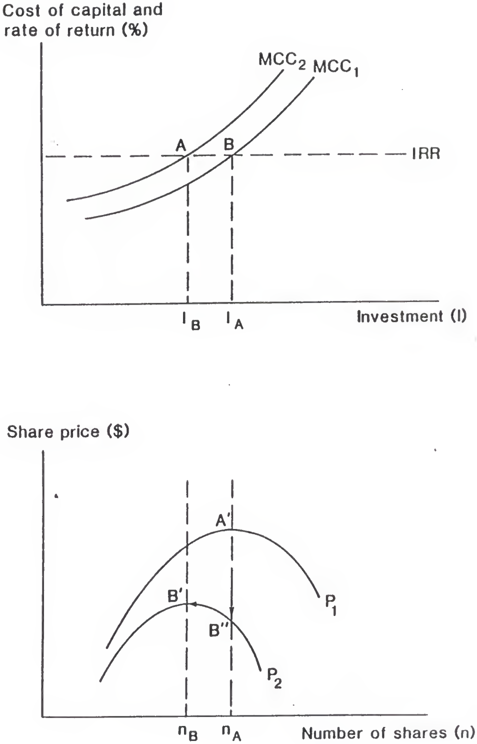

FIGURE 2

MEAN-PRESERVING INCREASE IN RISK

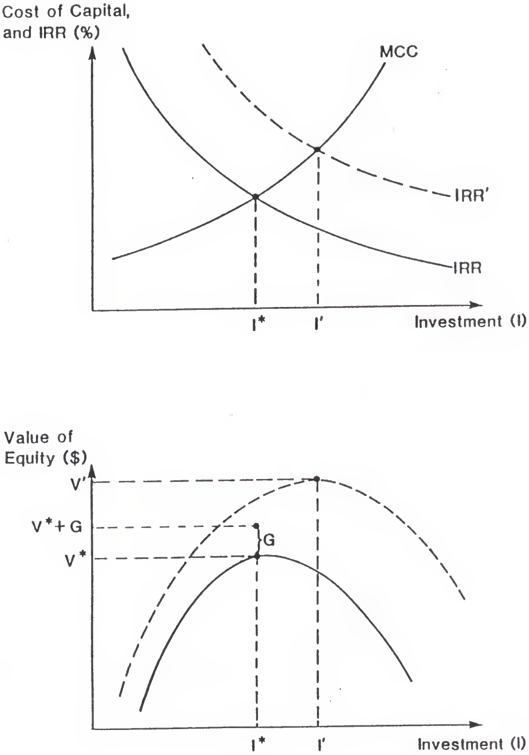

FIGURE 3

UNEXPECTED INCREASE IN RATE-OF-RETURN

CHAPTER 3
RESEARCH DESIGN

Data and Sample Selection

There are three basic methods by which a firm can repurchase its common stock - via a self-tender offer, a purchase in the open market, or in a private purchase. Only self-tender offers are analyzed in this study since information on open market and private purchases is not readily available.[1] Repurchase announcements were identified through the Wall Street Journal, Wall Street Journal Index, and the Dow Jones News Retrieval Data Service for the years 1979 through 1988. This search resulted in 127 self-tender offer announcements.

The sample was screened according to the following criteria:

a) Firms were eliminated from the sample if it was known that the repurchase was either in response to a hostile takeover attempt, or as a move to take the company private (i.e., a leveraged buy-out).

b) If the stock was not traded on the New York or American Stock Exchanges, or if less than five years of return data were available on the Center for Research in Security Prices (CRSP) monthly return tapes, it was eliminated from the

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sample. This restriction was imposed so that both a 60-month estimation period as well as a 24-month estimation period could be analyzed.

Also, in the short-term event study four additional firms were excluded from the sample since daily return data was not available on the 1989 CRSP daily return tape when this study was conducted. In our analysis of rational expectations and sample selection bias, three additional firms were excluded. (See Chapter 7 for a complete discussion.)

c) If the original repurchase announcement date could not be reasonably identified, the firm was excluded from the sample. For example, the Dow Jones News Retrieval Data Service (which provides the most comprehensive source of announcements) may cite an announcement that XYZ company recently completed its self-tender offer for X number of shares of stock. The procedure in this case was to search from this date backwards in order to locate the original announcement date. However, upon searching the records there were a few incidents where the date of the original announcement could not be found. No explanation for the inability to locate the original announcement could be determined. The announcement date is defined as the first day that the repurchase announcement appeared in either the Wall Street Journal, Wall Street Journal Index, or the Dow Jones News Retrieval Data Service.

It is interesting to note that in a number of cases there was a lag in the reporting of the first announcement date among these three sources. The Dow Jones News Retrieval Data Service provided the earliest announcement date and never reported a repurchase later than the day the announcement appeared in the Wall Street Journal Index. This follows since the Dow Jones News Retrieval Data Service is a comprehensive news source which includes not only announcements made in the Wall Street Journal, Barron's, and other business news sources, but also includes news releases from the associated press.

d) Firms were eliminated from the sample if the number of shares outstanding and closing stock price one month prior to the month in which the tender offer was announced were not available in Media General Industriscope. This requirement was imposed so that the sample could be analyzed in terms of the percent of equity repurchased by each firm (in market value terms). Only information on Reynolds and Reynolds was not available during this period so it was eliminated from the final sample.

e) If the repurchase was for minority shareholdings or for odd lot shares only, then the firm was excluded from the sample.[2]

f) Repurchases for sporadic purposes, such as the retirement of a particular class of common stock (or stock swaps), are not included in the sample.[3]

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g) Each firm in the sample was screened to determine if any other significant events occurred around the tender offer announcement date which might influence the effect of the repurchase announcement (e.g., a takeover attempt). The firms were also screened to ascertain whether an announcement of the issuance of debt occurred around the repurchase announcement.[4] These firms were also eliminated from the sample.

The final sample consists of fifty-five exchange-listed firms which announced a stock repurchase via a self-tender offer between 1979 and 1988.

Empirical Models

Event study methodology provides a means of analyzing the impact of an event on security prices. In this study, the effect of self-tender offer announcements on stock returns is examined. There are three basic models commonly used in event studies to analyze security pricing behavior: 1) the single index model; 2) the risk-adjusted return model;[5] and 3) the mean-adjusted return model. Underlying each of these models are assumptions which may bias the results. The potential biases and theoretical interpretation of each model are discussed below.

Single Index Model

The single index model (also referred to as the market model) asserts that the time series model specification of a security's return is of the form:

$$R_{jt} = \alpha_j + \beta_j R_{it} + \epsilon_{jt} \qquad (1)$$

where R_{jt} is the return on security j at time t;

R_{it} is the return on an index i at time t (where the index could be defined as the return on the market portfolio or S&P 500);

β_j is the covariance between the security and the index chosen;

α_j is the intercept; and

ϵ_{jt} is the error of the regression for security j at time t.

Note that interpretation of the intercept, α_j, in the single index model is somewhat unclear. That is, the single index model may provide explanatory power in determining security pricing behavior, but it is devoid of theoretical justification. Another difficulty associated with the single index model is that it assumes both α and β are constant over the entire time period analyzed - both the estimation and event periods. This can be a significant drawback if the period being analyzed is long (e.g., the long-term analysis discussed in the next chapter). Interpreting the single index model in terms of the Capital Asset Pricing Model (CAPM) is not always appropriate. This becomes apparent upon examining the risk-adjusted return model.

Risk-Adjusted Return Model

The risk-adjusted return model is similar to the single index model:

$$(R_{jt} - r_{ft}) = \alpha_j + \beta_j(R_{mt} - r_{ft}) + \epsilon_{jt} \qquad (2)$$

where R_{jt} is the return on security j at time t;

R_{mt} is the return on the market portfolio at time t;

r_{ft} is the risk-free rate of interest at time t;

β_j is the covariance between security j and the market portfolio;

α_j is the intercept; and

ϵ_{jt} is the error of the regression (i.e., the residual).

Although the single index model and the risk-adjusted return model appear to be very similar when the index chosen is the market portfolio, they differ significantly in their theoretical interpretation. The risk-adjusted return model has two main advantages. First, it is consistent with the return generating process of the Capital Asset Pricing Model (hereafter denoted CAPM) and thus can be interpreted on the basis of accepted financial theory. Consequently, the concept of an "abnormal" or "excess" return has theoretical meaning. This becomes more transparent if the relationship between equation (2) and the CAPM is examined.

The CAPM asserts that a security's ex-ante return is of the form:

$$E[R_j] = r_f + \beta_j(E[R_m] - r_f) \qquad (3)$$

Where $E[R_j]$ is the expected return on security j and r_f, β_j, and $E[R_m]$ retain the definitions given in equation (2) above. Therefore, the CAPM asserts that the expected return on a security is determined by the risk-free rate of interest plus the covariance of the security with the market, multiplied by the market risk premium (defined as $R_m - r_f$). To facility a comparison of the intercept in equation (2) with the CAPM of equation (3), equation (3) can be rearranged algebraically as follows:

$$E[R_j] = r_f + \beta_j E[R_m] - \beta_j r_f \qquad (4)$$

Then isolating r_f one obtains:

$$E[R_j] = r_f(1 - \beta_j) + \beta_j E[R_m] \ . \qquad (5)$$

Comparing the single index model of equation (1) and the CAPM of equation (5), the importance of the stability of r_f (and β_j) over time becomes more apparent. The advantage of the risk-adjusted return model capturing the variability of the risk-free rate of interest as well as providing theoretical interpretation consistent with the CAPM, becomes evident. In addition, even if r_f is constant during both the estimation and event periods, r_f is an observed variable and hence its estimation (α_j in equation (1)) is not required.

Note that the intercept in the risk-adjusted return model (equation (2)) can be interpreted as $r_f(1 - \beta_j)$.[6] If r_f is fairly stable during the estimation and the event periods (which may be true when very short periods of time are analyzed), then the single index model and the risk-adjusted return model provide similar results since both assume that β_j is constant. If, however, r_f is not constant over time (which is likely over long periods such as in the long-term event study discussed in Chapter 4), then the single index model fails to capture this factor and may bias the results. Failure to capture the variability of r_f may indicate the existence of an abnormal return when in fact it does not exist.

Mean-Adjusted Return Model

The mean-adjusted return model asserts that the return on a security is of the form:

$$R_{jt} = E[R_j] + \epsilon_{jt} \qquad (6)$$

where R_{jt} is the return on security j in period t;
$E[R_j]$ is the mean return on security j; and
ϵ_{jt} is the estimation error (i.e., the residual).

One advantage of the mean-adjusted return model is that unlike the risk-adjusted return model which relies on the security's beta (β_j) in determining its expected return, the mean-adjusted return model does not depend on a specific return generating process. That is, the mean-adjusted return model does not make any assumptions regarding the determinants of the security's return -- the return may be determined by its beta (covariability with the market, β_j), its own variance (σ^2_j), skewness (μ_3), etc.[7]

A bias may occur when using the mean-adjusted return model, however, if the period used to estimate the mean return is characterized by rising (declining) prices, but the event period is characterized by declining (rising) prices.[8] This type of measurement error can, of course, affect any event study. Since the risk-adjusted return model adjusts for general market movements through β_j, it may be less affected by this estimation error. The potential bias associated with use of the mean-adjusted return model, however, is expected to diminish when the sample size is large and both time series and cross-sectional data are analyzed. Specifically, one would not expect the mean return on all securities in the sample to be characterized by rising (declining) prices during each security's estimation period, and then declining (rising) prices during each security's event period. On average, securities with estimation periods during rising prices should be offset by those with estimation periods during declining prices and vice versa.

In order to analyze the relationship between the risk-adjusted and mean-adjusted return models, the Spearman Rank Correlation was computed. The Spearman Rank Correlation is a nonparametric measure of association between the two models. First, the average residuals of each firm for each model in the twelve months prior to the month of the repurchase announcement were calculated (i.e., the time series average excess return of each firm was determined). The firms were then ranked in ascending order by their average residuals and their ranking by each model determined. Table 3-1 shows the ranking of the firms by each model as well as the rank correlation coefficient and corresponding t-statistic. For example, the residual of American Can (firm 1) is ranked 42nd by the risk-adjusted return model and 47th by the mean-adjusted return model. The Spearman Rank Correlation considers how the ranking differs by each model. In the example of American Can, the difference is 5. The precise formula for the Spearman Rank Correlation coefficient and accompanying t-statistic for large samples is given in detail at the bottom of Table 3-1. If the two models were perfectly consistent, meaning the same results would be obtained by either model, the difference (denoted d) would be zero and the rank correlation coefficient would be +1. Table 3-1 shows that the rank correlation coefficient between the two models is significantly positive at 0.43, but quite different from +1. This implies that the results obtained do depend on the model selected and hence the return generating processed assumed.[9]

All three models are analyzed in this study. The mean-adjusted and risk-adjusted return models are examined in the long-term event study discussed in the next chapter. The single index model and mean-adjusted return model are analyzed in the direct test of the signalling hypothesis discussed in Chapter 5. Only the results of the risk-adjusted and single index models are presented in the following chapters. The results of the mean-adjusted return model are relegated to the appendix, but similar results are obtained.

Notes

1. The Securities and Exchange Commission (SEC) does make information on open market purchases available to the public; however, reproduction of this information is not available in any form and therefore was not realistically available.

2. The motive behind these repurchases are assumed to be associated with transactions costs incurred in servicing these shareholders. However, it is recognized that these repurchases may also be in response to a change in the firm's investment opportunities; that is, if a significant number of shares were repurchased from minority shareholders, then in essence the firm could not only be reducing its servicing costs, but also responding to a change in its investment opportunities.

3. The motive behind these repurchases is fairly apparent.

4. It could be argued that if the repurchase was financed with debt, then the motive behind the repurchase may represent a transfer of wealth from bondholders to shareholders. The wealth expropriation hypothesis addresses repurchases for this reason.

5. By "risk-adjusted return model" it is not meant that the other two models do not adjust for risk. Each model adjust for risk; however, the assumption of the return generating process underlying each model is different and is discussed in the following section.

6. In equation (3), α_j is expected to be zero since r_f has been subtracted from the securities return.

7. The importance of the securities own variance, σ^2_j in its price determination has been well documented. See, for example Lintner [1965], Miller and Scholes [1972], and Fama and MacBeth [1974].

8. A bias may occur even if $E[R_j]$ was estimated in a period of normal prices, but the event period is characterized by declining (or increasing) prices.

9. Dann [1981] uses the mean-adjusted return model and documents a 17% abnormal return associated with repurchase announcements. Vermaelen [1981] uses the risk-adjusted return model and reports an excess return of approximately 13%. While both document a statistically significant positive abnormal return around the repurchase announcement, the magnitude of the return depends on the model selected. Similar results between the mean-adjusted and risk-adjusted return models are obtained in this study (see Chapters 4 and 5 as well as the appendix).

TABLE 3-1

SPEARMAN RANK CORRELATION
BETWEEN RISK-ADJUSTED AND MEAN-ADJUSTED RETURN MODELS

Risk-Adjusted Model:			Mean-Adjusted Model:			
Rank	Firm	Avg. Firm Residual	Rank	Firm	Avg. Firm Residual	d^2
42	1	0.01990	47	1	0.02395	25
23	2	-0.00084	8	2	-0.03479	225
27	3	0.00441	41	3	0.01104	196
14	4	-0.00595	7	4	-0.04508	49
16	5	-0.00537	30	5	0.00266	196
24	6	0.00166	26	6	-0.00071	4
55	7	0.05624	52	7	0.04134	9
34	8	0.01239	21	8	-0.00448	169
17	9	-0.00537	12	9	-0.01889	25
19	10	-0.00432	3	10	-0.09082	256
18	11	-0.00457	20	11	-0.00526	4
31	12	0.00879	10	12	-0.02773	441
7	13	-0.01492	35	13	0.00495	784
10	15	-0.00973	11	15	-0.02618	1
26	16	0.00417	36	16	0.00632	100
13	17	-0.00909	15	17	-0.01524	4
39	18	0.01488	13	18	-0.01695	676
33	19	0.01076	25	19	-0.00147	64
28	20	0.00527	46	20	0.01898	324
46	21	0.02237	37	21	0.00754	81
47	22	0.02246	51	22	0.03867	16
8	23	-0.01099	43	23	0.01523	1225
49	24	0.02918	31	24	0.00413	324
29	25	0.00597	27	25	-0.00006	4
1	26	-0.08924	2	26	-0.10529	1
2	27	-0.07114	4	27	-0.08408	4
45	28	0.02103	29	28	0.00216	256
5	29	-0.02607	28	29	0.00031	529
56	30	0.06525	56	30	0.10060	0
44	31	0.02062	38	31	0.00802	36
21	32	-0.00218	45	32	0.01784	576
15	33	-0.00559	16	33	-0.01159	1
35	34	0.01240	49	34	0.02970	196
9	35	-0.01037	32	35	0.00420	529
11	36	-0.00946	9	36	-0.03140	4
54	38	0.04768	54	38	0.06867	0
40	39	0.01562	48	39	0.02675	64
4	40	-0.04333	1	40	-0.13702	9
37	41	0.01296	42	41	0.01417	25
38	42	0.01457	19	42	-0.00590	361
6	43	-0.02030	33	43	0.00422	729
50	44	0.03069	50	44	0.03444	0

TABLE 3-1. continued

Risk-Adjusted Model: Mean-Adjusted Model:

Rank	Firm	Avg. Firm Residual	Rank	Firm	Avg. Firm Residual	d^2
12	45	-0.00927	40	45	0.00925	784
3	46	-0.05156	5	46	-0.07914	4
22	47	-0.00218	6	47	-0.04891	256
51	48	0.03272	18	48	-0.00702	1089
53	49	0.04368	55	49	0.07318	4
48	50	0.02450	14	50	-0.01635	1156
41	51	0.01973	17	51	-0.00801	576
43	52	0.01998	44	52	0.01716	1
32	53	0.01056	34	53	0.00425	4
20	54	-0.00346	24	54	-0.00158	16
30	55	0.00615	39	55	0.00893	81
52	56	0.04348	53	56	0.05832	1
25	57	0.00168	22	57	-0.00413	9
36	58	0.01246	23	58	-0.00244	169

SPEARMAN RANK CORRELATION 0.433082

T-STATISTIC 14.24365

*The Spearman rank correlation is calculated as follows:

$$R_s = 1 - \frac{6*\Sigma d^2}{N(N^2 - 1)}$$

Where N is the number of pairs of ranks, and d^2 is the squared difference in rankings between the two models.

The large sample T-test: $R_s[(N - 2)/(1/R_s^2)]^{1/2}$

CHAPTER 4
LONG-TERM EVENT STUDY

Hypotheses

In Chapter 2, the various hypotheses advocated in the literature for the motives behind stock repurchases were discussed. Currently, the most popular explanation is the signalling theory which views stock repurchasing as a method used by management to signal that the firm is undervalued. It maintains that management possesses information not known to the market about the favorable future outlook (e.g., profitability) of the firm. By repurchasing its stock, the firm is said to reveal this "favorable" asymmetric information and consequently the stock price increases. Dann [1981], Vermaelen [1981], Masulis [1980], Comment and Jarrell [1989], and others have investigated this explanation by looking at the effect of self-tender offer announcements on security prices in the days surrounding the repurchase announcements. On average, they document an abnormal return of approximately 13% to 17% in the days surrounding buy-back announcements. It is concluded, therefore, that a stock repurchase serves as a credible signal of a firm's true value.

In this study a competing, and to date untested, motive for buy-backs is investigated -- the free cash flow/overinvestment explanation. Recall from Chapter 2 that Jensen [1986] defines free cash flow as cash flow in excess of that required to fund all investment projects with positive net present values.[1]

A firm accumulating free cash flow may: a) distribute it via a cash dividend, b) repurchase some of its stock, or c) overinvest, that is, invest in negative marginal net present value (NPV) projects.[2] Maximizing value, however, dictates that free cash flow should be distributed to shareholders; therefore, a firm with free cash flow should either distribute it as a cash dividend or repurchase some of its stock.

Lang and Litzenberger [1989] investigate the free cash flow and signalling hypotheses in connection with changes in cash dividends. They find evidence supporting the free cash flow explanation and refuting the signalling explanation. Stock repurchases and the free cash flow/overinvestment explanation is investigated in this study.

The source of the firm's free cash flow may result either from an unexpected increase in profitability, or from a risk-preserving decrease in the mean rate of return on the firm's investments both occurring in the past.[3] First, the unexpected increase in the profitability of the firm is shown diagrammatically in Figure 3 (see Chapter 2). Initially, it is assumed that the firm determines its optimal investment strategy where the internal rate of return (IRR) and marginal cost of capital (MCC) curves intersect, denoted I^* on Figure 3.[4] If the value of the firm is denoted by V and its investment by I, then value is maximized where dV/dI = 1; that is, where all positive NPV projects are accepted and the NPV of the marginal project is negative. In such a value maximizing equilibrium, the amount of resources to be reinvested as well as the amount to be distributed to shareholders is determined.

If, however, the actual return on the firm's investments is greater than the expected return, the firm experiences an unexpected increase in its cash flow (referred to as a favorable event in this study and denoted G in Figure 3 or W in Figure 4). As shown in Figure 4, if the firm initially invests at I^*, where dV/dI = 1; maximizing value implies that the free cash flow generated by the unexpected increase in profitability should be distributed to shareholders since the NPV of the next project is negative. For example, if the firm distributes only a fraction of the extra cash flow, say W', then the balance is overinvested and the stock price is not maximized.[5] As shown in Figure 4, the value of the firm increases from V^* to V^{**} when the extra cash flow, W, is earned. If the firm distributes only a fraction of this unexpected profit, say W', then the value of the firm increases only to $V^* + W'$ which is less than V^{**} since at this point the firm is overinvesting $W - W'$.

Alternatively, a stock repurchase may be motivated by the "lack" of profitable investment opportunities. As formally modeled by Ben-Horim and Levy [1988], a stock repurchase may be due to a risk-preserving decrease in the mean rate of

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return on the firm's investments, or a mean-preserving increase in risk (see Chapter 2). For example, assume a project which consists of exporting shoes to Japan is a positive NPV project initially. Upon exporting the shoes, however, the firm incurs new tariff fees which decreases the profitability of the project until it becomes a negative NPV investment. As shown in Figure 2 and discussed in Chapter 2, failure of the firm to contract by repurchasing $n_A - n_B$ shares of stock, results in it overinvesting (i.e. investing in negative NPV projects).[6]

The motives for stock repurchases can be summarized as follows:

M1: Signalling. The manager possesses asymmetric favorable information on the future profitability of the firm and signals this information to the market by repurchasing some of its stock;

M2: Free Cash Flow/Overinvestment. The firm experiences an inward shift of its investment opportunity frontier in the past due to, for example, an increase in the price of raw materials or loss of market share. To maximize value, the firm responds by repurchasing some of its stock; or

M3: Free Cash Flow/Overinvestment. The actual profitability of the firm's investments (IRR) is greater than expected which results in the firm accumulating free cash flow. This unexpected profit is not expected to persist in the future and hence the MCC and IRR curves do not shift. In order to maximize value, the firm distributed the extra cash flow by repurchasing some of its stock.

Studies of M1 have concentrated only on the pricing behavior of securities in the days surrounding the tender offer announcement (see Dann [1981], Vermaelen [1981], Comment and Jarrell [1989], among others). Both M2 and M3 imply that the motive for stock repurchases occurs prior to the day of the repurchase announcement, and, therefore, just analyzing the days around the announcement date is not sufficient.

In this study, a long-term analysis of stock repurchases and the free cash flow explanation is examined. The signalling explanation is tested by examining the strength of the signal conveyed by stock repurchase announcements. The long-term analysis of stock buy-backs is discussed below. A more direct test of the signalling explanation is discussed in the next chapter.

Since the events consistent with the free cash flow/over-investment hypothesis may occur over a long period of time, cumulative average residual methodology (hereafter denoted CAR) is employed. CAR methodology captures the effects of an event even though its exact date is not known. The event period in the long-term study is defined as twelve months prior to the month in which the repurchase announcement occurred and six months thereafter.

Consistent with the signalling explanation (M1), the cumulative average residuals (excess returns) during the period prior to the announcement date should be zero. This follows since the signalling theory states that the stock is undervalued due to asymmetric information regarding the future profitability of the firm. Therefore, the cumulative residuals prior to the repurchase announcement are expected to be zero on average.

The free cash flow/overinvestment explanation (M2 and M3) predicts that the cumulative average residuals prior to the repurchase announcement are expected to be different from zero, depending on the source of the free cash flow. If the free cash flow arises from an unexpected increase in the firm's profitability (a "favorable" event), the CAR's are expected to be positive prior to the buy-back announcement. This follows since information about a "favorable" event is expected to be disseminated in the market and consequently should be reflected in the stock's price. However, if the free cash flow occurs as a result of an "unfavorable" event (e.g., a decrease in the profitability of the firm), then the CAR's prior to the repurchase announcement are expected to be negative (see the discussion in Chapter 7). The precise methodology employed to test the hypotheses above is discussed in the next section. First, the hypothesis that stock repurchases are consistent with the free cash flow/overinvestment explanation is analyzed. Second, the signalling explanation is examined in Chapter 5 by evaluating the strength of the signal conveyed by repurchase announcements.

The results of both the long-term event study and the short-term event study are presented in Chapter 6. A test of rational expectations and sample selection biases inherent in event studies are presented in Chapter 7. Individual firms are analyzed in detail in Chapter 8 in order to obtain a more comprehensive understanding of the repurchase phenomenon. Chapter 9 presents the summary and conclusions.

Methodology

Event study methodology is a well established technique of analyzing the impact of an event on security prices. Since the events leading to a stock repurchase under the free cash flow/overinvestment explanation may occur over a long period of time, there is no clear-cut event date. Therefore, cumulative average residual (CAR) methodology is employed in this study to analyze stock repurchase announcements. The general procedure for the long-term event study is as follows:

Define month 0 as the month in which the announcement of the repurchase occurred. Month 0 is, of course, not the same chronological date for all securities. If a firm repurchased its stock via a self-tender offer more than once during the period under study, then that firm has more than one t = 0 announcement date.[7] Month t = +1 is defined as the month subsequent to the announcement, t = -1 is one month prior to the announcement, and so forth. Since stock repurchases are hypothesized to be motivated by events occurring prior to the tender offer announcement, the residuals in the twelve months prior to the repurchase announcement and six months thereafter are examined.

The residuals for each firm, for each model, are calculated in the interval $-12 \leq t \leq +6$; that is, for one year prior to the repurchase announcement and six months thereafter (hereafter called the event period). The residuals from the mean-adjusted return model are given by:

$$\epsilon^{m}_{jt} = R_{jt} - E[R_j] \qquad (7)$$

where ϵ^{m}_{jt} is the residual for security j in month t (equation (3) in Chapter 3);

R_{jt} is the return on security j in month t; and

$E[R_j]$ is the mean return of security j;

The residuals from the risk-adjusted return model are given by:

$$\epsilon_{jt} = (R_{jt} - r_{ft}) - \beta_j(R_{mt} - r_{ft}) \qquad (8)$$

where ϵ_{jt} is the residual for security j in month t determined by the risk-adjusted return model (equation (2) in Chapter 3);

R_{jt} is the return on security j in month t as defined above;

r_{ft} is the one-month Treasury bill rate in month t (a proxy for the risk-free rate of interest);

β_j is the covariance of security j with the market;

R_{mt} is the total return on a portfolio of common stocks (a proxy for the market).

R_{mt} and r_{ft} were obtained from Ibbotson Associates 1989 Yearbook. $E[R_j]$, and β_j are estimated in the interval $-36 \leq t \leq -13$; that is, each securities expected return and beta are estimated in the two years prior to the event period.

The average residual for each model for month t relative to the announcement month is then computed as:

$$AR_t = \frac{\sum_{j=1}^{N_t} \epsilon_{jt}}{N_t} \tag{9}$$

where ϵ_{jt} is the residual defined in equation (7) or equation (8) above;

AR_t is the average residual for all securities in month t (t = 0 is the month in which the announcement occurred); and

N_t is the number of announcements for which data are available in month t.

The principal test involves examining the behavior of AR_t for t in the interval $-12 \leq t \leq +6$; that is, for one year and six months surrounding the announcement. Additionally, since the cumulative effects of the abnormal return behavior in the months surrounding the tender offer are of interest, the behavior of the cumulative average residuals, denoted CAR_t, are analyzed. CAR_t is defined as:

$$CAR_T = \sum_{t=-12}^{T} AR_t \tag{10}$$

in the interval $-12 \leq T \leq +6$. Specifically, the following intervals (denoted CAR_{1T} and CAR_{2T}) are analyzed both for the entire sample as well as the subgroups discussed below.

$$CAR_{1T} = \sum_{t=-12}^{-1} AR_t \tag{11}$$

$$CAR_{2T} = \sum_{t=-12}^{+6} AR_t \tag{12}$$

The average residual, AR_t, can be interpreted as the average deviation in month t relative to month t = 0 of the stocks' returns from their expected returns. Similarly, the cumulative average residuals, CAR_{1T} and CAR_{2T} can be interpreted as the cumulative deviation from month t = -12 to t = -1 and t = -12 to t = +6, respectively; that is, CAR_t shows the cumulative effects of the differences of the returns from their expected behavior.

The hypothesis that a stock repurchase is in response to a risk-preserving decrease in the firm's mean rate of return on investment which occurs in the past and will persist in the future implies:

H_o: $CAR_{1T} = 0$ versus

H_a: $CAR_{1T} < 0$

in the interval $-12 \leq t \leq -1$.[8] That is, the cumulative average residuals are negative prior to the announcement month reflecting the fact that the firm's investment curve has shifted.

Alternatively, if the repurchase is in response to an unexpected increase in profitability in the past, one expects:

H_o: $CAR_{1T} = 0$ versus

H_a: $CAR_{1T} > 0$

in the interval $-12 \leq t \leq -1$. As stated earlier, consistent with the signalling hypothesis (M1), $CAR_{1T} = 0$ is expected in the interval $-12 \leq t \leq -1$. Initially, AR_t and CAR_t are analyzed for all fifty-six firms in the sample. Next, the analysis is refined by dividing the sample into three subgroups based on the source of the firm's free cash flow.[9]

In their study on the effect of changes in cash dividends on stock prices, Lang and Litzenberger [1989] measure the intensity of overinvestment using Tobin's Q. In this study, the following criteria are used:

The financial statements of each firm corresponding to three years prior to the announcement date were analyzed. The sample was stratified based on analysis of the following financial variables: a) capital expenditures; b) net operating income (NOI); c) net sales; and d) earnings per share (EPS).[10] The accounting data were obtained from the

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Industrial Compustat tapes or from the firm's annual and/or 10-K reports. The sample was partitioned as follows:

Subgroup 1. If at least one of the financial variables defined above (e.g., net sales) declined consistently in the two years prior to the repurchase announcement as well as in the quarter prior to the repurchase, and, in addition, there was no systematic increase in any of the remaining financial variables, then that firm was classified into subgroup 1. Three For example, GATX announced a self-tender offer on May 16, 1986 for approximately 31.10% of its stock (see appendix Table A-47). Analysis of GATX's financial statements reveals that its yearly growth rate in net sales, capital expenditures, deferred taxes and earnings per share all declined (negative growth) in the two years prior to the repurchase announcement. In the quarter prior to the repurchase announcement, its quarterly growth rate in net sales also declined. None of the financial series reveals constant growth and hence this firm falls into subgroup 1. Firms in subgroup 1 are consistent with the overinvestment hypothesis arising from a decrease in the expected return on investments (i.e., M3 above). The cumulative average residuals of firms in this subgroup are therefore hypothesized to be negative:

$$CAR_{1T} < 0 \qquad (11)$$

Subgroup 3. Subgroup 3 consists of firms where at least one of the financial variables analyzed increased consistently and there was no systematic decrease occurring in any of the remaining variables during the two years prior to the repurchase announcement as well as in the quarter prior to the repurchase. An example is SEDCO (see appendix Table A-39) which announced a repurchase tender offer for approximately 27.81% of its stock on February 18, 1982. SEDCO experienced positive growth in operating income, EPS, deferred taxes and capital expenditures in the two years prior to the repurchase announcement. None of the financial series declines consistently (monotonically) during this period and hence this firm falls into subgroup 3. Subgroup 3 is representative of firms experiencing an unexpected increase in profitability. Therefore, the following is expected:

$$CAR_{1T} > 0 \tag{12}$$

Subgroup 2. The remaining firms were classified into subgroup 2. Firms in subgroup 2 display no systematic trend in any of the financial variables analyzed. It is possible that these firms represent firms who repurchase stock to signal asymmetric information regarding the value of the firm. If they do indeed depict the signalling theory then we expect:

$$CAR_{1T} = 0 \tag{13}$$

(A profile of each firm is given in the appendix.)

Additional information can be gained by analyzing the cumulative residuals subsequent to the repurchase. Once the information consistent with M1 or M3 is absorbed into the market and the firm announces the repurchase, no further effect is expected. Therefore, CAR_{2T} should not be statistically different from CAR_{1T} for firms in subgroup 3. However, if unfavorable news (defined, for example, as a risk-preserving decrease in the mean rate of return on the firm's investments (e.g., firms in subgroup 2) may continue to be revealed after $t = 0$, then we may find that $CAR_{2T} < CAR_{1T}$. For example, in the short run management may be able to partially conceal unfavorable information by controlling the release of all negative information or by "creative" reporting. However, management has no apparent incentive to conceal favorable information. Consequently, favorable news is expected to be disseminated and hence absorbed in the market relatively fast.

The test of statistical significance for AR_t and CAR_t are t-statistics which is computed for both the combined sample and for each subgroup. The t-statistic for AR_t in equation (9) is given by:

$$T = AR_t \;/\; (\delta(AR_t))^{1/2} \qquad (15)$$

where $\delta(AR_t)$ is the variance of the average residual at period t and $(\delta(AR_t))^{1/2}$ is the standard deviation. Likewise, the test of statistical significance of CAR_t in equation (10):

$$T = CAR_t \;/\; (\delta(CAR_t))^{1/2} \qquad (16)$$

where $\delta(CAR_t)$ is defined as:

$$\delta(CAR_t) = \frac{\sum_{j=1}^{N_t} (CAR_{jt} - \overline{CAR_t})^2}{N_t - 1} \qquad (17)$$

Both the mean-adjusted and the risk-adjusted return models are analyzed; however, since both models yield similar results, only the empirical results of the risk-adjusted model will be discussed in Chapter 6. The results of the mean-adjusted return model can be found in the appendix (Tables A-1 to A-4). (A detailed examination of the potential biases associated with each model as well as the measure of association between the mean-adjusted and risk-adjusted return models can be found in Chapter 3.) A profile of each firm also appears in the appendix.

Notes

1. See Jensen [1986], page 323.

2. Note that investing in negative net present value projects may include not only real projects, but also excessive perk consumption or holding idle cash.

3. As shown in Ben-Horim and Levy [1988], a risk-preserving decrease in the mean rate of return and a mean-preserving increase in risk lead to the same effect. Only a risk-preserving decrease in the expected rate of return is discussed.

Also, the unexpected increase in profitability may represent a shift in the firm's IRR curve versus a one time increase in profit (see Figure 3). In this situation the firm may in fact need to raise capital (e.g. issue new stock) in order to undertake these profitable investments. This as well as a mean-preserving decrease in risk are not analyzed in this study but rather are left for future research.

4. An all equity firm is assumed for simplicity only. A firm experiencing free cash flow and wishing to maintain its existing debt-to-equity ratio would repurchase both debt and equity.

5. Note that in this framework, maximizing stock price is equivalent to maximizing value.

6. Note that this is simply a risk-preserving decrease in the expected rate of return discussed in Chapter 2 and shown diagrammatically in Figure 1.

7. One firm in the sample falls into this category -- Winn Dixie Stores which repurchased stock via a self-tender offer twice during the sample period.

8. Also analyzed is an event period of twenty-four months before the repurchase announcement and six months thereafter where a five year estimation period was used. Using such a long estimation and event period (since monthly data is analyzed), the stability of the parameter estimates become highly questionable. Therefore, only the results of the nineteen month event period are reported and discussed.

9. One firm is loss during the subgrouping due to the lack of financial data.

10. Since there is some danger that management can manipulate the financial statements of the firm in the short run, three years of financial data were analyzed.

FIGURE 4

FREE CASH FLOW

CHAPTER 5
SHORT-TERM EVENT STUDY

Hypotheses

One approach to disentangling the hypothesis that firms repurchase their stock to signal it is undervalued from the hypothesis that stock repurchases are motivated by the free cash flow/overinvestment explanation, is to analyze the strength of the signal conveyed by repurchase announcements. If stock repurchases are indeed used to signal that a firm is undervalued (signalling), then the larger the percent of equity repurchased in market value terms the stronger the signal conveyed and hence the larger the expected excess return. Recall that the signalling hypothesis asserts that the firm's stock is undervalued due to asymmetric information. Therefore, the more the stock is undervalued the more the firm should repurchase to signal the extent of the undervaluation. Also, the larger the tender offer premium the more the firm is undervalued and hence the stronger the signal. This follows since there are two factors to be considered in a tender offer -- the number of shares repurchased and the price paid for each share. For example, a firm can repurchase one-hundred shares of stock at a premium of $20.00 a share, or it can repurchase 200 shares of stock at a premium of $10.00. In both cases the firm expends $2,000 to repurchase its stock and both factors signal the extent to which the firm is believed to be undervalued. Consistent with the signalling theory, a positive association between the excess return on the stock (residual) and both the percent of equity repurchased and the tender offer premium is expected; the lack of association implies that the firm could convey the same signal by repurchasing one share of stock at a premium of one penny.

On the other hand, the free cash flow/overinvestment explanation (discussed in Chapters 2 and 4), implies that no association between the residuals of the firm around the repurchase announcement (i.e., t = 0) and either the percent of equity repurchased or the tender offer premium is predicted. This follows since consistent with the overinvestment hypothesis, the percent of stock repurchased should be a function of the magnitude of an event occurring in the past and in a rational expectations equilibrium, this event should already be taken into account in the stock's price. Consequently, no association between the excess daily return and either the percent of equity repurchased or the tender offer premium should exist.[1] Therefore, the two competing explanations can be tested by examining the strength of the signal conveyed in the days surrounding the repurchase announcement.

Methodology

The strength of the signal conveyed by stock repurchase announcements is tested by analyzing the association between the residuals of the firm and both the percent of equity repurchased and the tender offer premium. The residuals are determined for both the mean-adjusted return model and the single index model. Only the details of the single index model are discussed below since similar results are found with the mean-adjusted return model. (See equation (7) in Chapter 4 for the specification of mean-adjusted return model.)

In Chapter 3, the advantages and disadvantages of the single index model, the risk-adjusted return model, and the mean-adjusted return model were discussed. An advantage of the risk-adjusted return model is that if the period being examined is long and r_f is not constant, then the risk-adjusted return model has the advantage of capturing this variability, and since r_f is an observed value there is no basis for estimating it. However, since we test the strength of the signal conveyed by repurchase announcements in the days surrounding the repurchase announcement (i.e., for the days $t = -1$, $t = 0$, and $t = +1$), and the estimation period is sixty days prior to the event period, little if any bias is expected from the use of the single index model versus the risk-adjusted return model.[2]

The daily return data were obtained from the Center for Research in Security Prices (CRSP) daily return tapes. The firms tender offer premium was obtained from the Wall Street Journal, Wall Street Journal Index, or Dow Jones News Retrieval Database.

As specified in equation (1) of Chapter 3, the residuals of the single index return model are given by:

$$\epsilon_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt}) \qquad (17)$$

where ϵ_{jt} is the residual for security j on day t;

R_{jt} is the return of security j on day t; and

R_{mt} is the value weighted return index from CRSP on day t.

The residuals from equation (17) in the interval $-1 \leq t \leq +1$ and on day t =0 are used to test the strength of the signal conveyed by repurchase announcements using the following cross-sectional regression.[3]

$$\epsilon_{jt} = \alpha_j + \beta_{1,t} R^P{}_j + \beta_{2,t} T^P{}_j \qquad (18)$$

where ϵ_{jt} is the residual of firm j on day t estimated from equation (17) above;

$R^P{}_j$ is the percent of equity repurchase by firm j; and

$T^P{}_j$ is the tender offer premium of firm j.

The percent of equity repurchased is defined as follows:

$$R^P{}_j = \frac{N_j \times P^T{}_j}{P^O{}_j N^O{}_j} \qquad (19)$$

where N_j is the number of shares announced to be repurchased by firm j;

P^T_j is the tender offer price of firm j;

P^O_j is the price of the stock of firm in the month prior to the month in which the repurchase announcement occurred; and

N^O_j is the number of shares outstanding in the month prior to the month in which the repurchase announcement occurred;

Both N^O_j and P^O_j were obtained in Media General Industriscope and were as of the last day of the month prior to the month in which the repurchase announcement occurred. This was the earliest and most consistent source for determining the total market value of the firm's outstanding equity prior to the repurchase.

The tender offer premium of firm j, denoted T^P_j, is measured as:

$$T^P_j = \frac{(P^T_j - P^B_j)}{P^B_j} \tag{20}$$

where P^B_j is the price of the stock five days prior to the announcement day; and

P^T_j is the tender offer price of the jth firm.

P^B_j was chosen five days prior to the event period in order to avoid any contamination on the stock price by information leakages around the repurchase announcement.

The signalling theory predicts a positive association between the percent of equity repurchased and the tender offer premium in equation (18) above:

$$H_o: \quad \beta_{1,t} > 0 \text{ and } \beta_{2,t} > 0 \qquad (21)$$

That is, $\beta_{1,t}$ and $\beta_{2,t}$ are expected to be significantly positive if the signalling theory of stock repurchasing is correct. Failure to find a positive association between the percent of equity repurchased and the tender offer premium, implies that firms could signal its stock was undervalued by repurchasing a single share of its stock for a minimal premium (say a premium of one penny).

The average residual from equation (17) at t = 0 and for the interval $-1 \leq t \leq +1$ is analyzed for fifty-one firms in the sample.[4] Also analyzed is the strength of the signal conveyed by each of the three subgroups outlined in Chapter 4. Recall that subgroup 1 is characteristic of firms who have experienced an inward shift in their investment opportunity curve, whereas subgroup 3 is characteristic of firms who have experienced an unexpected increase in profitability. For both of these subgroups we do not expect any significant association between the average firm residuals and the tender offer premium or the percent of equity repurchased. However, since clear-cut support for the free cash flow explanation was not found for firms in subgroup 2, it is possible that firms falling in this group indeed repurchase their stock to signal they are undervalued. If this is correct, then the daily excess return on the announcement day may be larger for subgroup 2 then for subgroup 1 or 3. To test this hypothesis, the following cross-sectional regression is examined:

$$\epsilon_{jt} = \alpha_t + \beta_{1,t}R_j + \beta_{2,t}T_p + \beta_{3,t}D_1 + \beta_{4,t}D_3 \qquad (22)$$

where ϵ_{jt}, R^{P}_{j}, and T^{P}_{j} are defined in equation (18) above;

D_1 is a dummy variable which is 1 if the firm belongs to subgroup 1 and 0 otherwise; and

D_3 is a dummy variable which is 1 if the firm belongs to subgroup 3 and 0 otherwise.

If firms in subgroup 2 indeed repurchase stock to signal that they are undervalued, one expects that $\beta_{3,t}$ and $\beta_{4,t}$ in equation (22) to be significantly negative since subgroup 2 is omitted from the regression to avoid linear dependency between the independent variables. If $\beta_{3,t}$ and $\beta_{4,t}$ in equation (22) are not significantly different from zero, one can conclude that the free cash flow hypothesis may also hold for firms falling in subgroup 2 even though the financial data does indicate the free cash flow hypothesis as clearly as indicated for subgroup 1 and 3.

Notes

1. For a discussion of rational expectations equilibria and sample selection bias see Chapter 6. Briefly, in a rational expectations equilibrium, no announcement effect is expected to exist. However, the announcement effect observed empirically can be fully explained when the inherent sample selection bias is taken into account.

2. The single index model is used since we get the same residuals when using the risk-adjusted return model since on a daily basis the risk-free rate is approximately zero. No significant variability in r_f will occur given the short time period analyzed.

3. We also analyze equation (18) using the mean-adjusted return model. The results are similar to the single index model and are relegated to the appendix.

4. The interval $-1 \leq t \leq +1$ is analyzed in order to capture leakages which may occur surrounding repurchase announcements. This is consistent with most daily event studies.

Also, the sample dropped from 56 to 51 firms due to the lack of daily return data for five firms in the sample from the currently available CRSP tapes. The lack of computerized data in the monthly study was not subject to this constraint.

CHAPTER 6
EMPIRICAL RESULTS

Long-Term Event Study

Using monthly data, the free cash flow/overinvestment explanation is examined. Analogous to Lang and Litzenberger [1989], the sample is stratified by the source of the firm's free cash flow (see Chapter 4). Recall that subgroup 1 is characteristic of firms experiencing an "unfavorable" event; subgroup 3 are firms hypothesized to have experienced a "favorable" event; and the financial data of firms in subgroup 2 display no consistently revealing trends.

Table 6-1 reports the results of the average risk-adjusted residuals, AR_t and the cumulative average residuals, CAR_t, for the entire sample in the interval $-12 \leq t \leq +6$. As shown in column 2, the AR_t's are positive in twelve out of the nineteen months analyzed and negative in the remaining seven months. Only $AR_{t = -12}$ and the $AR_{t = 0}$ are statistically significant at 2.2% and 7.8%, respectively with corresponding t-values of 2.157 and 4.315. In summary, for the combined sample the average risk-adjusted residuals are not significantly different from zero prior to the announcement month, t = 0, or thereafter.

Column 4 shows the number of firms with positive and negative residuals in each month of the event period. For example, at t = -12, 34 of the 56 firms in the sample have positive residuals and the remaining 22 firms have negative residuals. While it appears that prior to the announcement date, t = 0, more firms have positive residuals (except for month t = -6), it is interesting to note that 13 out of the 56 firms in the sample have negative risk-adjusted residuals in the month of the announcement. This is contrary to the signalling theory. If the motive for stock repurchases is indeed to signal that a firm is undervalued, then one would expect the risk-adjusted residuals to be positive around the repurchase announcement. That is, one would expect the value of all firms which employ this "credible signal" to increase. Of course, it may be that these 13 firms suffered a setback around the buy-back announcement, resulting in the negative risk-adjusted residual. However, it seems unlikely that a firm experiencing negative information would be unable to concealed it until after the buy-back was announced. The observation of firms experiencing "negative" announcement effects is not unique to this study. Dann [1981] reports in his study of tender offers, that 17 of the 138 firms in his sample had negative residuals on day t = 0.

Finally, the cumulative average risk-adjusted residual, CAR_t, and corresponding t-statistic are reported in columns 5 and 6, respectively. CAR_t is positive over the entire event period but are statistically significant only at t = -12 and in the interval from t = 0 to t = +6. On the announcement month, the CAR_t increases to 13.3% with a t-value of 3.016, and remains at approximately 13% from t = +1 to t = +6 (which is consistent with the results found in earlier studies of self-tender offer announcements). The results using the mean-adjusted return model are provided in Table A-1 in the appendix.

One is tempted to conclude from the above results that the signalling theory is confirmed since the CAR_t's are not significantly different from zero in the period prior to the announcement, are significantly positive at t = 0, and remain positive and significant from t = 0 to t = +6. However, these findings are also consistent with the free cash flow/over-investment explanation. To see this, recall the free cash flow/overinvestment theory, M2 and M3, discussed in Chapter 4. M2 is consistent with the explanation that an "unfavorable" event occurred within the firm, and hence: H_o: $CAR_{1T} < 0$; that is, the CAR_t's are hypothesized to be negative prior to the repurchase announcement. M3 is characteristic of an "favorable" event occurring and hence: H_o: $CAR_{1T} > 0$. Specifically, the cumulative average risk-adjusted residuals under the free cash flow explanation are hypothesized to be of opposite sign depending on the source of the firm's free cash flow; consequently, for the combined sample CAR_{1T} may be zero on average. Also, $CAR_{1T} = CAR_{2T}$ is consistent with both M2 and M3. Therefore, one cannot necessarily conclude that the results of the combined sample confirms the signalling explanation.

To disentangle the free cash flow and signalling explanations, the following tests are conducted. First, the analysis of AR_t and CAR_t is refined by analyzing each of the three subgroups outlined in Chapter 4 separately. Next, a more direct test of the signalling theory is conducted by examining the strength of the signal conveyed by repurchase announcements.

Tables 6-2 through 6-4 report the results of AR_t and CAR_t for subgroup 1 through 3, respectively. Each is discussed in turn below.

Subgroup 1. Subgroup 1 is hypothesized to include those firms considered to have experienced an "unfavorable" event, e.g., a risk-preserving decrease in the mean rate of return on investment. Fourteen out of the fifty-six firms in the sample fall into this subgroup. Consistent with this group is the hypothesis that $CAR_{1T} < 0$. Column 2 of Table 6-2 reveals that in seven of the twelve months prior to the announcement month, AR_t is negative (and is negative in eleven of the entire nineteen months analyzed). The only statistically significant average risk-adjusted residual (AR_t) for this subgroup is one month prior to the announcement month, t = -1. $AR_{t=-1}$ is a negative 5.7% (with a corresponding t-value of -2.43) which is consistent with the free cash flow/overinvestment explanation for firms experiencing a negative event in the past. Also, $AR_{t=0}$ is a mere 0.9% and statistically insignificant with a t-statistic of only 0.231. Therefore, there is no announcement effect documented for firms in subgroup 1. Thus, the average risk-adjusted residuals of subgroup 1 do not conform with the signalling theory.

Columns 4 and 5 of Table 6-2 report the cumulative average risk-adjusted residual CAR_t and t-statistics, respectively. Two points are worth noting: 1) CAR_t is negative in 17 out of the 19 months in the event period, with only two positive CAR_t's at t = -12 and t = -7. Only $CAR_{t=-10}$ and $CAR_{t=-9}$ are statistically significant (negative 6.1% and 6.7%, respectively). 2) Contrary to the signalling theory, the CAR_t's are negative for the entire period from t = -6 to t = +6. Thus, while the cumulative average risk-adjusted residuals do not conform with the signalling explanation, they are consistent with the free cash flow/over-investment theory for firms experiencing an "unfavorable" event. Also, the AR_t's and CAR_t's remaining negative after t = 0 are consistent with "unfavorable" news being disseminating gradually in the market due to management's ability to partially conceal bad information. Therefore, as hypothesized $CAR_{1T} < 0$ for subgroup 1 (although not statistically significant) partially supports the free cash flow explanation. The lack of statistical significance may be due to the small number of firms in this subgroup (i.e., 14 firms). Table A-2 provides CAR_t and AR_t for subgroup 1 using the mean-adjusted return model.

Subgroup 2. Recall that firms in this group display no clear-cut trend in the financial data. Therefore, firms in this subgroup may have experienced either a negative event in the past, a positive event in the past, or may in fact repurchase their stock to signal that the firm is undervalued. Table 6-3 reports AR_t and CAR_t for this subgroup. AR_t is negative in 6 out of the 12 months in the event period (and negative in 9 out of the entire 19 month event period) and statistically significant only at t = -9 and t = 0 with $AR_{t=-9}$ of 5% and $AR_{t=0}$ of 8% (with corresponding t-values of 2.09 and 2.685, respectively).

The results of columns 4 and 5 of Table 6-3 are interesting. If firms in this group indeed employ stock repurchases to signal asymmetric information, then $CAR_{1T} = 0$ and $CAR_{2T} = CAR_{1T}$ is expected. Note however that CAR_{1T} is statistically significant at t = -1 (with CAR of 8% and corresponding t-value of 2.13). Surprisingly, CAR_{2T} is highly statistically significant for seven consecutive months, that is from t = -1 to t = +5 with CAR_t's ranging from 8%, 16%, 11%, 11.2%, 13.5%, 12.1% and 12.4%, respectively. Even though the CAR_t's decrease after t = 0, it appears to conform with positive information continuing to be disseminated to the market even after the repurchase. (See Table A-3 in the appendix for the results using the mean-adjusted return model.)

Subgroup 3. This group consists of firm's associated with a positive or favorable event occurring in the past. Twenty-three firms fall into this subgroup. As shown in columns 2 and 3 of Table 6-4, AR_t is statistically significant at t = -4 and t = 0, and are negative in only 4 out of the 19 months analyzed. AR_t for these 4 months are very low at -0.6%, -0.4%, -0.5% and -0.4% (less than one per cent in each of these months).

The CAR_t's of this group strongly support the free cash flow explanation (see columns 4 and 5 of Table 6-4). First, the CAR_t's are positive for all 19 months in the event period and are highly statistically significant for the entire period from t = -7 to t = +6. Second, the CAR_t's are quite large, ranging from 2.7% at t = -12 to 37% at t = +6. These are very strong results! Analyzing CAR_{1T} (which corresponds to the interval $-12 \leq t \leq -1$), they are positive and statistically significant in eight out of the twelve months analyzed in the interval -- consistent with the null hypothesis discussed in Chapter 4. The highly significant CAR_t's from t = 0 to t = +6 is consistent with "favorable" outcomes continuing in the future. Therefore, one can conclude that stock repurchasing represents a process rather than a single announcement event.

(The results using the mean-adjusted return model are provided in Table A-4 in the appendix.)

In summary, when analyzing AR_t and CAR_t for the entire sample the results are ambiguous and the two competing explanations cannot be disentangled. By stratifying the sample, subgroup 3 is shown to strongly support the free cash flow hypothesis; subgroup 1 is found to weakly support the free cash flow hypothesis; and subgroup 2 appears to support the signalling theory during the period prior to $t = 0$ (with the CAR_t's not statistically significantly different from zero), but is inconsistent with the theory from $t = +1$ to $t = +6$. Therefore, a more direct test of the signalling hypothesis is employed in the short-term event study discussed below.

Short-Term Event Study

If firms repurchase their stock to signal that it is undervalued (signalling theory), the larger the percent of equity repurchased and the larger the tender offer premium, the stronger the signal conveyed, and consequently the larger the expected abnormal return at $t = 0$. To examine this explanation the following is analyzed.

First, the average daily risk-adjusted excess returns are analyzed in the interval $-1 \leq t \leq 1$ as well as $-3 \leq t \leq +3$. These are reported in Table 6-5. In part A, column 2 of Table 6-5, the only statistically significant average residual is at t = 0, with $AR_{t=0}$ of 5.657% and corresponding t-value of 6.466. A comparison of 5.657% excess return on day t = 0 with the 7.8% excess return found in month t = 0 (see Table 6-1) reveals that most of the excess return realized during the month of the announcement occurred on day t = 0. Also, the cumulative average risk-adjusted residuals shown in column 5 are positive and statistically significant from t = 0 to t = +1 at 5.710% to 5.995%, respectively.

Part B of Table 6-5 analyzes the daily residuals in the interval $-3 \le t \le +3$. Only $AR_{t=0}$ is statistically significant at 5.863% with a t-value of 6.537. Also, column 6 of Table 6-5 shows that the cumulative average residuals (CAR_t) are positive and statistically significant in the entire interval from t = 0 to t = +3.[1] (See Table A-5 for an analysis of the daily residuals using the mean-adjusted return model.)

Next, to test the strength of the signal conveyed by a repurchase announcement, the cross-sectional regression discussed in Chapter 5 and given in equation (15) was employed.[2] That it,

$$\epsilon_j = \alpha_j + \beta_1 R^p_j + \beta_2 T^p_j \qquad (15)$$

where ϵ_j is the average residual of firm j estimated by the single index model on day t = 0 as well as the sum of the daily residuals in the interval $-1 \le t \le +1$;

R^p_j is the percent of equity repurchased by firm j; and

T^p_j is the tender offer premium of firm j.

(see Chapter 5 for a complete discussion of equation (15) and Chapter 3 for a complete discussion of the single index model).

Table 6-6 reports the results of this cross-sectional regression. The signalling theory predicts a positive association between the average risk-adjusted residual and both the percent of equity repurchased and the tender offer premium. As explained earlier, this follows since the more the firm is undervalued, the more stock the firm is expected to repurchase and the higher the tender offer premium.

The top part of Table 6-6 reports the results of the regression using the residual on day t = 0 for all fifty-one firms included in the sample.[3] As shown in column 2, β_1 is -0.0331 with a corresponding t-value of -0.399, and β_2 is -0.0414 with a corresponding t-value of -0.888; thus, neither coefficients are statistically different from zero. Note that both β_1 and β_2 are negative which strictly contradicts the signalling theory which predicts both coefficients to be positive. The results of the sum of the residuals in the interval $-1 \leq t \leq +1$ are similar with $\beta_1 = -0.0571$ and $\beta_2 = -0.0447$ with corresponding t-values of -0.554 and -0.7728, respectively. Thus, these results also contradict the signalling explanation.

When analyzing the residuals of all fifty-one firms in the sample, three firms[4] were found to be possible outliers. To ensure that these three firms are not biasing the results

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against the signalling theory, these firms were deleted from the sample and the cross-sectional regression of equation (15) was reexamined. The results are reported in the lower part of Table 6-6 both for the residual on t = 0 and for the sum of the residuals in the interval of $-1 \leq t \leq +1$. Note that at t = 0, β_1 is positive (0.1072) as hypothesized by the signalling hypothesis, but still insignificant with a t-value of only 0.931. β_2, however, remains negative at -0.0155 with a corresponding t-value of -0.328; again refuting the signalling explanation. Recall that these results imply that the firm can disseminate the same credible signal by repurchasing a single share of stock at a premium of one cent.

Two other regressions were also analyzed. First, only the percent of equity repurchased (defined in Chapter 4), and the average residuals were analyzed. Equation (15) considers both the percent of equity repurchased and the tender offer premium since both factors determine the total cash disbursed through a stock repurchase. However, since the percent of equity repurchased in market value terms also considers the tender offer premium indirectly (hence a positive correlation between R^P_j and T^P_j of .711), the following simple cross-sectional regression was examined:

$$\epsilon_j = \alpha + \beta R^P_j \qquad (23)$$

where R^P_j is defined in equation (15) above. As explained above, the signalling hypothesis predicts the β should be significantly positive. As shown in the top portion of Table

6-7, when all fifty-one firms were included, β is negative when the dependent variable is either the sum of the daily residuals in the interval $-1 \leq t \leq +1$ as well as on $t = 0$, but not significantly different from zero. In the lower portion of Table 6-7, equation (23) is also analyzed when the three firms determined to be outliers were excluded from the sample. As shown in column 2, β becomes positive, but remains statistically insignificant.

In Chapter 4, the refinement of the sample into three subgroups based on the source of the firm's free cash flow was discussed. If firms in subgroup 2 indeed repurchase stock to signal that they are undervalued, then $\beta_{3,t}$ and $\beta_{4,t}$ in cross-sectional regression given in equation (22) are expected to be significantly negative since subgroup 2 is omitted from the regression. Recall equation (22):

$$\epsilon_{jt} = \alpha_j + \beta_{1,t}R^P{}_j + \beta_{2,t}T^P{}_j + \beta_{3,t}D_1 + \beta_{4,t}D_3 \qquad (22)$$

where ϵ_{jt}, $R^P{}_j$ and $T^P{}_j$ are defined in equation (15) above and D_1 is a dummy variable which is 1 if the firm belongs to subgroup 1 and 0 otherwise, and D_3 is a dummy variable which is 1 if the firm belongs to subgroup 3 and 0 otherwise.

Table 6-8 reports the results of equation (22) for ϵ_{jt} in the interval $-1 \leq t \leq +1$ and on $t = 0$. The top portion reports the results when all fifty-one firms are included in the sample and the lower portion reports the results when the sample is adjusted for outliers. Even with the outliers deleted, $\beta_{4,t}$ is positive (0.0112) and not statistically different from zero (having a t-value of 0.512), and $\beta_{3,t}$ while -0.0095, is not statistically different from zero (having a t-value of -0.322).

In summary, no support for the signalling theory was found when either the strength of the signal in terms of the percent of equity repurchased and/or tender offer premium were analyzed. In addition, although the financial profile of firms classified into subgroup 2 displayed on consistently revealing trends, firms in this subgroup do not appear to be consistent with the signalling theory.

Notes

1. The slight difference in AR_t and CAR_t between the interval $-1 \leq t \leq +1$ and $-3 \leq t \leq 3$ shown in Table 6-5 is of course due to the difference in the estimation periods. The estimation period when the event period is defined in the interval $-1 \leq t \leq +1$ is in the interval $-61 \leq t \leq -2$. Likewise, the estimation period is defined in the interval $-63 \leq t \leq -4$ when the event period of $-3 \leq t \leq +3$.

2. Use of both R^P_j and T^P_j is justified since the correlation between these two measures is .711.

3. Recall that five firms were eliminated from the sample due to the lack of data from the CRSP tapes at the time this study was conducted.

4. Gen Corp, Caesar's World and Standard Brands appeared to be outliers when the tests of the rational expectations equilibrium were conducted (see Chapter 7). In analyzing these firms, it was found that all three repurchased their stock in 1987. Specifically, Standards Brand Paints and Caesar's World repurchased their stock around the stock market crash in October, 1987 which may have influenced the stock repurchase of these firms.

TABLE 6-1

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUALS 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

RISK-ADJUSTED RETURN MODEL

COMBINED SAMPLE

(t)	AR(t)	T-Statistic	Positive: Negative	CAR(t)	T-Statistic
-12	2.2%	2.157**	34:22	2.1%	2.157**
-11	-0.9%	-0.808	47:29	1.2%	1.025
-10	-0.2%	-0.145	47:29	1.1%	0.700
-9	1.1%	1.066	49:27	2.2%	1.142
-8	0.5%	0.265	46:30	2.7%	1.172
-7	0.8%	0.750	46:28	3.5%	1.456
-6	-2.0%	-0.999	26:30	1.5%	0.486
-5	0.5%	0.476	49:27	2.4%	0.582
-4	1.7%	1.213	32:24	3.7%	0.916
-3	-0.2%	-0.122	47:29	3.4%	0.882
-2	2.1%	1.327	48:28	5.5%	1.369
-1	0.0%	0.000	47:29	5.5%	1.291
0	7.8%	4.315*	43:13	13.3%	3.016*
1	-1.4%	-0.808	50:26	11.9%	2.587*
2	2.4%	1.825	33:23	14.3%	3.015*
3	1.1%	1.037	49:27	15.4%	3.355*
4	-1.4%	-1.193	23:33	14.0%	2.930*
5	0.1%	0.163	48:28	14.2%	2.822*
6	-0.8%	-0.594	23:33	13.4%	2.315*

*Significant at 0.01
**Significant at 0.05

FIGURE 5

CUMULATIVE AVERAGE RESIDUAL (CAR_t) -- COMBINED SAMPLE

TABLE 6-2

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUAL 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

RISK-ADJUSTED RETURN MODEL

SUBGROUP #1

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	0.5%	0.199	0.5%	0.199
-11	-4.2%	-0.123	-3.7%	-1.612
-10	-2.5%	-1.213	-6.1%	-2.445*
-9	-0.5%	-0.367	-6.7%	-2.436*
-8	6.0%	0.788	-0.6%	-0.091
-7	1.9%	0.636	1.3%	0.178
-6	-10.4%	-1.290	-9.2%	-0.856
-5	1.1%	0.336	-8.1%	-0.645
-4	-2.4%	-0.566	-10.5%	-0.693
-3	-2.4%	-0.350	-12.8%	-0.997
-2	1.2%	0.267	-11.6%	-0.882
-1	-5.7%	-2.430*	-19.3%	-1.257
0	0.9%	0.231	-16.4%	-1.266
1	-0.1%	-0.020	-16.5%	-1.234
2	5.3%	1.600	-11.2%	-0.785
3	0.5%	0.230	-10.7%	-0.821
4	-2.7%	-0.874	-13.4%	-0.995
5	-1.6%	-0.800	-15.0%	-1.202
6	-5.3%	-1.930	-19.9%	-1.384

*Significant at 0.01.

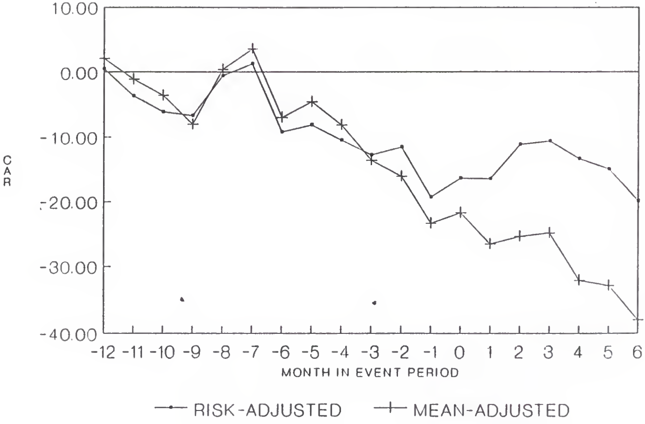

FIGURE 6

CUMULATIVE AVERAGE RESIDUAL
COMPARISON OF RISK-ADJUSTED AND MEAN-ADJUSTED RETURN MODELS
SUBGROUP 1

TABLE 6-3

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUALS 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

RISK-ADJUSTED RETURN MODEL

SUBGROUP #2

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	2.4%	1.500	2.4%	1.499
-11	-0.1%	-0.990	1.4%	0.842
-10	-0.2%	-0.125	1.2%	0.610
-9	5.0%	2.090**	6.2%	1.970
-8	-2.7%	-1.730	3.5%	1.043
-7	2.2%	0.127	3.7%	1.079
-6	1.6%	1.190	5.4%	1.379
-5	-0.6%	-0.353	4.8%	1.307
-4	-1.6%	-1.250	3.3%	0.828
-3	-0.6%	-0.377	2.6%	0.616
-2	2.0%	0.963	4.7%	1.169
-1	3.3%	1.103	8.0%	2.130**
0	8.0%	2.685*	16.0%	6.061*
1	-5.0%	-1.850	11.0%	3.863*
2	0.1%	0.097	11.2%	3.130*
3	2.3%	1.150	13.5%	3.928*
4	-1.3%	-0.867	12.1%	3.079*
5	0.3%	0.181	12.4%	3.275*
6	-3.2%	-1.620	9.5%	1.827

*Significant at 0.01
**Significant at 0.05

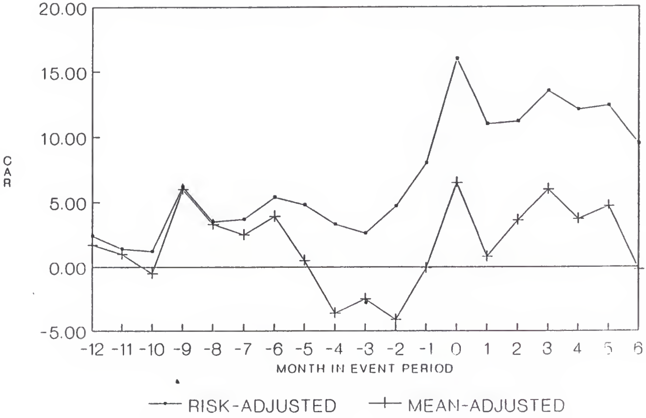

FIGURE 7

CUMULATIVE AVERAGE RESIDUAL
COMPARISON OF RISK-ADJUSTED AND MEAN-ADJUSTED RETURN MODELS
SUBGROUP 2

TABLE 6-4

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUALS 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

RISK-ADJUSTED RETURN MODEL

SUBGROUP #3

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	2.7%	1.860	2.7%	1.579
-11	0.9%	0.513	3.6%	1.610
-10	1.8%	0.902	5.4%	2.003**
-9	-0.6%	-0.508	4.8%	1.476
-8	0.4%	0.391	5.5%	1.710
-7	1.1%	0.839	6.6%	3.011*
-6	-0.4%	-0.276	6.2%	2.405*
-5	1.1%	0.705	7.3%	2.060**
-4	5.8%	2.580*	13.1%	4.213*
-3	2.1%	0.808	15.2%	4.152*
-2	3.2%	1.338	18.4%	4.363*
-1	0.7%	0.371	19.2%	4.251*
0	10.8%	3.853*	30.0%	5.755*
1	-0.5%	-0.216	29.5%	5.350*
2	2.7%	1.211	32.0%	6.328*
3	0.3%	0.166	32.5%	5.902*
4	-0.4%	-0.19	32.1%	6.367*
5	1.4%	1.019	33.5%	6.176*
6	3.6%	1.609	37.0%	5.493*

*Significant at 0.01
**Significant at 0.05

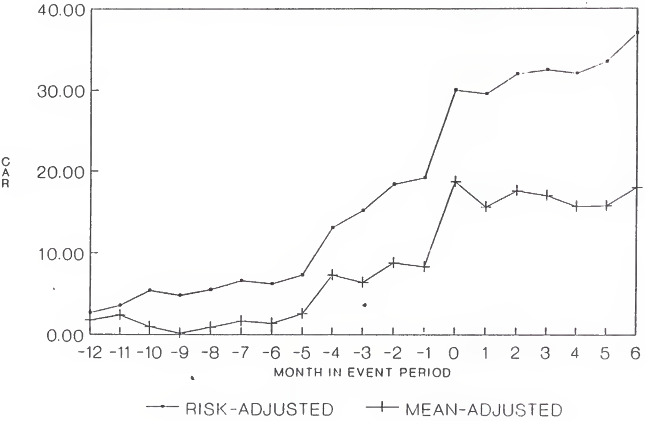

FIGURE 8

CUMULATIVE AVERAGE RESIDUAL
COMPARISON OF RISK-ADJUSTED AND MEAN-ADJUSTED RETURN MODELS
SUBGROUP 3

TABLE 6-5

ANALYSIS OF DAILY RESIDUALS AROUND THE TENDER OFFER ANNOUNCEMENT

SINGLE INDEX MODEL

Part A: One Day Interval

(t)	AR_t	S.E.	T	Positive: Negative	CAR_t	S.E.	T
-1	0.053%	0.0043	0.1245	25:26	0.053%	0.0043	0.1233
0	5.657%	0.0088	6.4658	42:09	5.710%	0.0099	5.7523
1	0.290%	0.0025	1.1728	27:24	5.995%	0.0110	5.4618

Part B: Three Day Interval

(t)	AR_t	S.E.	T	Positive: Negative	CAR_t	S.E.	T
-3	-0.151%	0.003	-0.507	19:32	-0.151%	0.003	-0.507
-2	0.032%	0.003	0.120	24:27	-0.119%	0.004	-0.338
-1	-0.152%	0.004	-0.412	24:27	-0.272%	0.006	-0.486
0	5.863%	0.009	6.537	42:09	5.591%	0.011	5.191
1	-0.164%	0.006	-1.031	22:29	5.427%	0.011	4.856
2	-0.044%	0.003	-0.214	21:30	5.383%	0.012	4.520
3	-0.076%	0.001	-0.479	24:27	5.319%	0.012	4.492

TABLE 6-6

STRENGTH OF THE SIGNAL

$$\epsilon_{jt} = \alpha_j + \beta_1 R^{P}_{j} + \beta_2 T^{P}_{j}$$

COMBINED SAMPLE

Interval:	$t = 0$		$-1 \leq t \leq +1$	
	Estimate	t-value	Estimate	t-value
α	0.0689	3.377	0.0756	2.982
β_1	-0.0331	-0.399	-0.0571	-0.554
β_2	-0.0414	-0.888	-0.0447	-0.773
N	51		51	

ADJUSTED FOR OUTLIERS

Interval:	$t = 0$		$-1 \leq t \leq +1$	
	Estimate	t-value	Estimate	t-value
α	0.0437	1.828	0.0486	1.618
β_1	0.1072	0.931	0.0818	0.566
β_2	-0.0155	-0.328	-0.0070	-0.118
N	48		48	

TABLE 6-7

STRENGTH OF THE SIGNAL

$$\epsilon_{jt} = \alpha_j + \beta_1 R^P_j$$

COMBINED SAMPLE

Interval:	t = 0		$-1 \leq t \leq +1$	
	Estimate	t-value	Estimate	t-value
α	0.05995	3.351	1.0671	0.567
β_1	-0.02614	-0.321	-0.0361	-0.042
N	51		51	

ADJUSTED FOR OUTLIERS

Interval:	t = 0		$-1 \leq t \leq +1$	
	Estimate	t-value	Estimate	t-value
α	0.0405	1.875	0.0472	1.741
β_1	0.1122	0.993	0.0841	0.594
N	48		48	

TABLE 6-8

STRENGTH OF THE SIGNAL

$$\epsilon_{jt} = \alpha_j + \beta_{1,t}R^P{}_j + \beta_{2,t}T^P{}_j + \beta_{3,t}D_1 + \beta_{4,t}D_3$$

COMBINED SAMPLE

Interval:	t = 0		$-1 \le t \le +1$	
	Estimate	t-value	Estimate	t-value
α	0.0603	2.605	0.0583	2.249
β_1	-0.0314	-0.355	-0.0178	-0.179
β_2	-0.0447	-0.937	-0.0409	-0.751
β_3	0.0044	0.159	-0.0069	-0.224
β_4	0.0168	0.804	0.0199	0.849
N	51		51	

ADJUSTED FOR OUTLIERS

Interval:	t = 0		$-1 \le t \le +1$	
	Estimate	t-value	Estimate	t-value
α	0.0377	1.461	0.0429	1.335
β_1	0.1217	0.971	0.1309	0.837
β_2	-0.0160	-0.329	-0.0022	-0.036
β_3	-0.0095	-0.322	-0.0317	-0.858
β_4	0.0112	0.512	0.0053	0.193
N	48		48	

CHAPTER 7
RATIONAL EXPECTATIONS AND SAMPLE SELECTION BIAS

Rational Expectations Equilibrium

Two competing paradigms explaining the stock price response to the announcement of a stock repurchase are the signalling and the free cash flow explanations. The signalling theory asserts that the agent (management) possesses positive asymmetric information and by announcing a stock repurchase (or an increase in cash dividends) the agent disseminates this information to the market (see Battacharya [1979], John and William [1985], and Miller and Rock [1985]). Therefore, the signalling theory predicts a favorable stock price response to the announcement of a stock buy-back.

On the other hand, the free cash flow explanation asserts that firms with substantial free cash flow tend to overinvest by accepting negative marginal net present value projects. Under this hypothesis, the agent has the incentive to expand beyond its optimal size (i.e., overinvest) due to the likelihood that a firm will incur monitoring by the capital markets if new capital must be raised in the future. This hypothesis therefore contends that the announcement of a stock repurchase reveals the investment policy of the firm. The effect of a stock repurchase on the repurchasing firm's stock depends upon the market's assessment of the extent to which the firm will (or will not) overinvest. This is illustrated graphically in Figures 4 and 5.

As discussed in Chapter 4, a firm's accumulation of free cash flow may occur either from a "favorable" or an "unfavorable" event occurring within the firm in the past. Let us first assume the firm's free cash flow occurs as a result of a favorable event. As shown in Figure 4 (see Chapter 4), the optimal level of investment is at I^* where the marginal cost of capital (MCC) and internal rate of return (IRR) curves intersect. Now suppose that the expected IRR or MCC curves do not change, but the firm receives a return which is larger than expected at the end of the first investment period (t_1). Also assume this random deviation occurs in the past, is well-known by the market and is not sustainable in the future. This is simply a cash flow drawn at random from a distribution with a given mean IRR. Unlike the signalling theory which assumes asymmetric information regarding future cash flows, the free cash flow hypothesis considers cash flows which have already occurred and are well-known to the market. For example, let W be the observed unexpected extra cash flow. If investors know with certainty that W will be distributed to shareholders (i.e., the firm will not overinvest), then the value of the firm will increase to $V^{**} = V^* + W$ (see Figure 4). However, if the firm overinvests and does not payout all of the extra cash flow, it moves along expansion curve V' rather than V. For example, the firm may invest up to I' or point a in Figure 4. If this level of investment is known with certainty, then the value of the firm will increase to $V^* + W'$ which is lower than V^*. At I', the firm is overinvesting by $I^* - I'$. In an efficient market under rational expectations, information on W as well as on the firm's new investment policy is known. If X/W is a random variable denoting the amount of cash distributed for a given W, then under rational expectations $E[X/W = W']$.

Let us assume that in response to this "favorable" event the firm announces a stock repurchase (or dividend increase) such that D is distributed to shareholders. If $D < W'$, a negative announcement effect is predicted and the value of the firm decreases at $t = 0$. Similarly, if $D > W'$, then a positive announcement effect is expected and the value of the firm increases at $t = 0$.[1] That is, if investors underestimate the firm's investment policy and hence overestimate D, a negative abnormal return is expected at $t = 0$; likewise, if investors overestimate the firm's investment policy a positive announcement effect is expected. Under rational expectations one expects investor's to randomly overestimate and underestimate a firm's investment policy, and thus on average the abnormal return at $t = 0$ is expected to be zero.

Alternatively, a firm may accumulate free cash flow as a result of an unfavorable event occurring in the past. For example, suppose a new competitor enters the market driving product prices and hence profits down. The firm's IRR curve will shift from IRR to IRR' as shown in Figure 9. To maximize value, the firm should respond by contracting (for example by repurchasing $n_A - n_B$ shares of stock, see Figure 1 and the discussion in Chapter 2). As shown in Figure 9, the shift in the firm's IRR curve changes the firm's optimal investment from I^* to I'. If this change is fully known to the market, the value of the firm will fall to V' at the time the shift occurs (see Figure 9). No further change in value is expected when the buy-back is announced since the event is already reflected in the stock's price when the shift in the IRR curve occurs.

As stated earlier, the free cash flow hypothesis (see Jensen [1986] and Lang and Litzenberger [1989]) postulates that firms tend to overinvest and in particular resist contracting. Therefore, assume the market recognizes the tendency of firms to overinvest and thus expect the firm to reduce its investment from I^* to I'' (versus I'). The value of the firm will drop from V^* to V''. If the firm's actual investment is greater than anticipated, a negative abnormal return at $t = 0$ is expected. Similarly, if the actual investment is less than anticipated by the market, then a positive announcement effect is predicted. Under rational expectations these estimation errors are expected to be zero on average and consequently no further announcement effect is predicted on day $t = 0$.

In summary, the signalling hypothesis predicts a positive announcement effect and zero excess return prior to the repurchase announcement; whereas, the free cash flow hypothesis predicts no announcement effect at $t = 0$ and either a positive or a negative excess return prior to the repurchase announcement depending on the specific event which has occurred in the past. Previous empirical studies appear to confirm the signalling hypothesis since they document approximately a 6% to 9% abnormal return on day $t = 0$ (see Dann [1981] and Vermaelen [1981]). However, under rational expectations, the observed positive announcement effect does not necessarily contradict the free cash flow hypothesis and hence may not necessarily support the signalling hypothesis. This follows since a positive announcement effect is also predicted under the free cash flow hypothesis given rational expectations and the sample selection biases. This is discussed next.

A simple example illustrates the sample selection bias inherent in an event study of stock repurchases. Assume there are N firms each possessing free cash flow. (The source of this free cash flow is not important.) Suppose that K of the N firms respond to the accumulation of free cash flow by repurchasing some of their stock and the remaining N - K firms do not repurchase any of their stock (or pay a cash dividend) and hence overinvest. In Figure 9, these K firms are located on segment AB, and all N - K firms are located at point B.

Since the market expects all firms to be at point C, firms located at point B are characterized by a negative abnormal return on day t = 0, and firms at point A are characterized by a positive announcement effect on day t = 0. However, firms at point B bias the results since they represent firms which should contract but do not; that is, they are not in the sample since they do not repurchase their stock. As discussed above, if all N firms are included in the sample there will be no announcement effect; however, given N - K firms are excluded from the sample, a positive announcement effect is expected since exclusion of these firms creates a sample bias.

Testable Implications and Results

In the above discussion, all firms were assumed to be identical. In practice, however, each firm may have different amounts of free cash flow and therefore are expected to repurchase different proportions of their shares. The announcement effect observed at t = 0 is a function of both the market's assessment of the amount the firm will repurchase (predicted repurchase) and the number of shares the firm actually repurchases. The testable implications of these results are the following.

Denote the true expected value of the total cash payout to the stockholders via a stock repurchase by $E[R_j]$ and the actual percent of repurchase by R^P_j. Define the difference between the actual percent repurchased from the expected percent repurchased by d_j (i.e., $d_j = R^P_j - E[R_j]$). If $d_j > 0$, a positive announcement effect is expected, and if $d_j < 0$, a negative announcement effect is predicted. Suppose that $E[R_j]$ can be estimated and hence d_j can be determined. The following regression tests the two competing explanations -- signalling versus free cash flow:

$$e_j = \alpha + \beta d_j + \epsilon_j \tag{24}$$

where e_j is the risk-adjusted return on the day of the announcement, t = 0 as well as for the sum of day t = -1 and t = 0 defined by equation (15) in Chapter 5. The sum of the residuals from t = 0 plus t = -1 are analyzed in order to capture any information leakages on day t = -1. As discussed above and illustrated in Figures 4 and 5, the free cash flow hypothesis predicts that $\beta > 0$. On the other hand, the signalling hypothesis predicts $\beta = 0$.

Testing equation (24), however, requires that the d_j be computed and hence the market's true prediction of the firm's contraction, $E[R_j]$, be estimated. Since $E[R_j]$ is unobservable, let R^e_j (a proxy for $E[R_j]$) denote an estimate of the total cash payout to stockholders via a stock repurchase. The deviation between the actual and expected contraction is therefore defined as $d_j = R^P_j - R^e_j$; where R^P_j is the actual cash payout of the jth firm. Note that there are numerous methods of estimating R^e_j. In this study, a proxy for the firm's economic setback or favorable event (R^e_j) is the cumulative average residual of the jth firm (CAR_j) in the twelve months preceding the announcement as defined by equation (10) in Chapter 4. CAR_j is an appropriate proxy for the intensity of the event since, for example, the more severe the setback in the firm the more negative CAR_j and the larger the degree of contraction (or stock repurchase) expected. Large negative CAR_t's are expected to be accompanied by large repurchases and vice versa. The CAR_t's in the twelve months prior to the repurchase announcement is used since the exact date of the event (either favorable or unfavorable) is unknown. Furthermore, since a process precipitates the firm's contraction (rather than a single event), monthly data is used to estimate CAR_j. Also, the regression analysis is conducted separately for firms characterized by negative CAR_t's versus positive CAR_t's since the sign of β_i depends on whether the firm is characterized by a favorable or unfavorable event. That is, for firms characterized by negative CAR_j, the more unfavorable the event the more negative CAR_j and the larger the market's expectations regarding the degree of contraction ($E[R_j]$). Since $CAR_j = 0$ implies that no event (either favorable or unfavorable) has occurred in the past, no contraction predicted and a regression through the origin is used to estimate β_i; that is,

$$R^P_j = \hat{\beta}_i CAR_j + \epsilon_j \qquad (25)$$

where R^P_j is the percent of equity repurchased by the jth firm defined by equation (19) in Chapter 5; CAR_j is defined by equation (10) in Chapter 4; and β_i denotes whether equation (25) is estimated from group 1, group 2 or the combined sample (denoted β_1, β_2, and β_3, respectively). The estimated total cash payout to the stockholders is then defined as $R^e_j = \hat{\beta}_i CAR_j$. For firms with $CAR_j < 0$ (group 1), $\beta_1 < 0$ is expected, see Figure 9. Since group 2 is characterized by firms with $CAR_j > 0$, $\beta_2 > 0$ is predicted as shown in Figure 3. For comparison only, regression equation (25) is also examined for the entire sample and although not justified theoretically, one would expect β_3 to be a weighted average of β_1 and β_2. Therefore, for the combined sample β_3 is not expected to be significantly different from zero.

Table 7-1 reports the results of regression given in equation (25). Recall that equation (25) is estimated separately for group 1, group 2 and the combined sample. Part A of Table 7-1 shows that for firms with negative CAR_t's (i.e., group 1), $\beta_1 = -6.909$ and is statistically significant with a corresponding t-value of -2.7. Part B shows that for firms in group 2 (i.e. firm where $CAR_j > 0$), $\beta_2 = 4.627$ and is statistically significant with a t-value of 3.99. As expected, for the combined sample, $\beta_3 = 1.721$ and is not statistically different from zero (having a t-value of 1.313).

Now having an estimate of $E[R_j]$ and the actual repurchase, R^P_j, d_j can be determined as follows:

$$d_j = R^P_j - R^e_j \tag{26}$$

Finally, recall regression equation (24):

$$e_j = \alpha + \beta d_j + \epsilon_j \tag{24}$$

This regression analyzes rational expectations equilibrium which predicts a positive association between d_j and e_j for both group 1 and group 2. That is, the larger d_j, the larger the predicted value of e_j. Table 7-2 reports the results of regression equation (24). Part A shows that for on day $t = 0$, $\beta = .0684$ and is not statistically significant with a t-value of 1.284. However, when both $t = -1$ and $t = 0$ are analyzed (which captures information leakages on day $t = -1$), $\beta = 0.1588$ and is statistically significant with a t-value of 2.105.

In summary, the empirical results above conform much better with the free cash flow hypothesis rather than the signalling hypothesis since the signalling hypothesis predicts that $\beta = 0$ in equation (24). Also recall that the results of the direct test of the signalling hypothesis conducted in Chapter 5 do not conform with the signalling hypothesis. In conclusion, support for the free cash flow hypothesis is found. This does not rule out the use of stock repurchasing by some firms to signal asymmetric information, but merely suggests that the dominate factor for stock buy-backs is the firm's need to adjust its size and investment.

Note

1. This is completely analogous to W' versus W being distributed to shareholders.

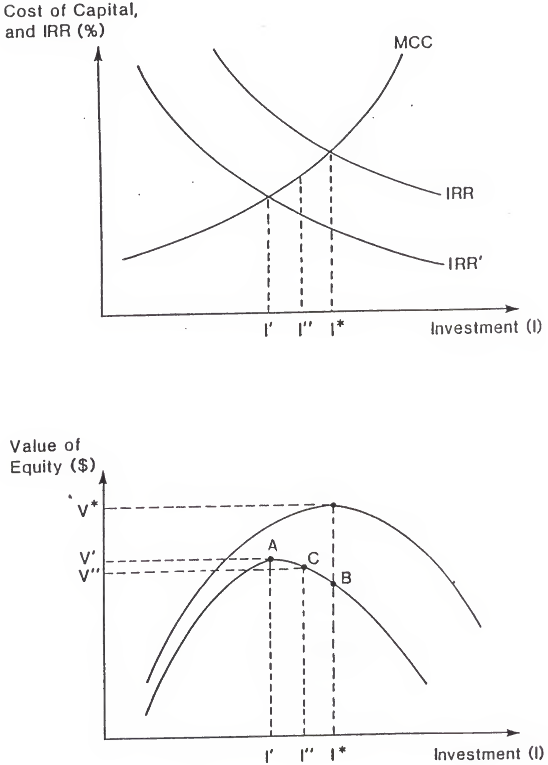

FIGURE 9

SELECTION BIAS

TABLE 7-1

RATIONAL EXPECTATIONS
ESTIMATE OF EXPECTED REPURCHASE $E[R_j]$

$$R^P_j = \beta_i CAR_j$$

Part A: Firms with $CAR_j < 0$

	Estimate	t-value	Prob > |t|
β_1	-6.909	-2.701	0.0146

Part B: Firms with $CAR_j > 0$

	Estimate	t-value	Prob > |t|
β_2	4.627	3.992	0.0004

Part C: Combined Sample

	Estimate	t-value	Prob > |t|
β_3	1.721	1.313	0.1953

TABLE 7-2

TEST OF RATIONAL EXPECTATIONS

$$e_j = \alpha + \beta d_j + \epsilon_j$$

PART A: For t = 0

	Estimate	Standard Error	t-value	Prob > |t|
α	0.0115	0.008	1.402	0.1678
β	0.0684	0.053	1.284	0.2057

PART B: For t = -1 plus t = 0

	Estimate	Standard Error	t-value	Prob > |t|
α	0.0427	0.012	3.690*	0.0006
β	0.1588	0.076	2.105**	0.0408

* Significant at .005
** Significant at .025

CHAPTER 8
FIRM ANALYSIS - A CASE STUDY

In order to provide a better understanding of stock buy-backs, and to analyze the free cash flow and signalling explanations, each firm in the sample was analyzed individually. For example, up to five years of financial data for each firm was accumulated and analyzed. In the appendix, specific information on each firm is provided. Two firms will be discussed in detail below.

Table A-6 provides a summary of the financial data for I. C. Industries who announced a buy-back of 17.57% (in market value terms) on November 23, 1981. The announcement reported in the Dow Jones News Retrieval Database stated:

> I. C. Industries, Inc. announced a tender offer to purchase as many as three million of its own common shares -- representing a stake of 17.3% -- for $36 each. It cited the customary reason for such stock repurchases: The feeling that its shares are "undervalued and therefore represent an excellent investment at this time."

Thus the firm states that it is repurchasing its stock to signal it is undervalued. To analyze this statement, the financial profile of I. C. Industries (see Table A-6) was examined. Note that in the year prior to the year in which the repurchase was announced the cash account decreased 34.5%, long-term debt declined 10.78%, net sales increase 10.9%, operating income increased 12.38%, capital expenditures increased 9.38%, and earnings per share increased 11.94%. The risk-adjusted cumulative average residual (CAR) for I. C. Industries at t = -1 is 17.49%, and at t = 0 the average residual is 4.8%. Indeed, the two month average residual is 7.881% and the cumulative average residual over the entire event period is 19.32%. These results are consistent with the signalling hypothesis and appear to support the motive given by the company when the repurchase was announced.

Another company is Penn Central Corporation who repurchased 24.63% of its outstanding equity (in market value terms) on June 26, 1984. The following announcement by Penn Central appeared in the Dow Jones Retrieval Database:

> Penn Central Corporation said its board has approved a proposal to purchase as many as 5 million shares of its common stock at $47.00 per share . . . The company will reserve the right to purchase up to an additional 2.5 million shares if the offer is oversubscribed Penn Central said. Penn Central has 32 million common shares outstanding. Alfred Martinelli, President and Chief Executive Officer, said the stock is an "attractive investment opportunity" at present, particularly in light of Penn Central's strong cash position . . .

Comparing the information in the news release with the financial data reported in Table A-7, several items are of interest. First, note that Penn Central's cash account increased in the year prior to the repurchase 255.8%, from $89.3 million to $317 million! In addition, its long-term debt decreased 36.13%, its net sales decreased almost 20%, operating income decreased 22.99%, and earnings per shares decreased almost 100%. The free cash flow/overinvestment explanation for stock repurchases would predict all of the above trends. The decline in the earning variables may suggest that Penn Central experienced what is characterized as an unfavorable event in this study. The only variable which is not consistent with the free cash flow explanation is the growth in capital expenditures of approximately 90% in the year prior to the year of the repurchase. However, since Penn Central sold part of its assets to Mesa Petroleum Company, the growth in capital expenditures may be misleading. Using the risk-adjusted return model, Penn Central's cumulative average residual at $t = -1$ is 14.87% and the risk-adjusted average residual at month $t = 0$ is 9.26%. This is consistent with the free cash flow hypothesis given the market, seeing the strong cash positive of Penn Central, overestimated the degree of overinvestment by the firm. That is, the actual repurchase announced by Penn Central was greater than expected by the market resulting in a positive announcement effect for this particular firm. (Recall the discussion of rational expectations and sample selection bias in Chapter 7.)

A summary of each firm is provided in the appendix. The discussion above of the Penn Central and I. C. Industries shows that repurchasing is indeed a complex phenomenon.

CHAPTER 9
SUMMARY AND CONCLUSION

Stock repurchasing is a complex phenomenon apparently motivated by many factors. The objective of this study is to investigate two competing explanations -- signalling versus free cash flow/overinvestment. Currently, the most popular explanation of the stock price response to repurchase announcements is the signalling theory. This theory asserts that stock repurchases serve as credible signals that a firm's stock is undervalued. Dann [1981], Vermaelen [1981], and Comment and Jarrell [1989] (among others), document approximately a 13-15% positive abnormal return in the days surrounding repurchase announcements and conclude that their empirical findings support the signalling hypothesis.

The object of this study is to investigate an alternative explanation -- free cash flow/overinvestment. The free cash flow explanation asserts that stock repurchasing is a consequence of a long-term process which begins prior to the repurchase announcement. Recently, Lang and Litzenberger [1989] analyze the stock price response to changes in cash dividends and conclude that their results conform with the free cash flow/overinvestment explanation rather than the signalling explanation.

In this study, the free cash flow theory is investigated by stratifying the sample into three subgroups based upon each firm's financial time series data. Firms in subgroup 1 are hypothesized to have experienced a setback (such as a risk-preserving decrease in the firm's mean rate of return on investment); firms in subgroup 3 are characteristic of firms which have experienced a favorable event (such as an unexpected increase in the rate of return on investment); and subgroup 2 includes firms in which no clear-cut event is indicated by the financial data. In the long-term event study, a negative cumulative average abnormal return (CAR) of up to -19% was found for firms in subgroup 1. Large positive CAR's (up to 37%) were found for subgroup 3. The CAR's for subgroup 2 were also found to be positive (9.5%) which simply indicates that more of the firms in this subgroup appear to have experienced a favorable versus an unfavorable event. These results conform to the explanation that firms falling into the two extreme groups accumulate cash either due to the lack of good investment opportunities or by unexpected profits in the past and use the free cash flow to repurchase some of their stock.

While these results reveal information on the source of free cash flow employed by firms to buy-back their stock, it does not strictly refute the signalling theory. Therefore, a direct test of the signalling explanation is conducted. If the signalling theory is the dominate explanation for stock repurchases, one would expect that the larger the signal the larger the abnormal return on the announcement day. The association between the residual on the announcement day (as well as in the days surrounding the announcement) with the percent of stock repurchased (in market value terms) and the tender offer premium is investigated in this study. A positive association between these two signals is not found, and hence the signalling theory is not supported.

Finally, the free cash flow/overinvestment explanation for stock repurchases predicts no average announcement effect under rational expectations, but a positive association between the risk-adjusted return between the jth firm and the difference between the actual and predicted repurchase. This association is tested in Chapter 7. No support for the signalling theory is found; in fact, the coefficients are found to be negative which strictly contradicts the signalling theory.

In summary, support for the free cash flow theory is found in the long-term event study. A direct test of the signalling explanation as well as a test of rational expectations fails to support the signalling hypothesis. Finally, it is not ruled out that some firms use stock repurchasing to signal that the firm's stock is undervalued. However, the empirical results of this study suggest that the dominate motive for stock repurchases is the need to adjust the size of the firm due to the accumulation of free cash flow.

APPENDIX

TABLE A-1

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUAL 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

MEAN-ADJUSTED RETURN MODEL

COMBINED SAMPLE

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	1.86%	1.667	1.86%	1.667
-11	-0.71%	-0.670	1.15%	0.841
-10	-1.54%	-1.032	-0.39%	-0.208
-9	-0.09%	-0.735	-0.49%	-0.196
-8	1.08%	0.459	0.59%	0.184
-7	0.34%	0.316	0.93%	0.271
-6	-2.14%	-1.059	-1.21%	-0.281
-5	-0.07%	-0.059	-1.28%	-0.263
-4	0.25%	0.145	-1.03%	-0.192
-3	-1.83%	-0.580	-2.11%	-0.379
-2	-0.58%	-0.348	-2.69%	-0.447
-1	-1.02%	-0.672	-3.72%	-0.570
0	6.79%	3.910*	3.07%	0.468
1	-3.15%	-1.690	-0.07%	-0.010
2	1.37%	1.275	1.30%	0.182
3	6.27%	0.539	1.92%	0.264
4	-2.69%	-2.131*	-0.77%	-0.101
5	-0.13%	-0.118	-0.89%	-0.112
6	-1.86%	-1.135	-2.76%	-0.314

*Significant at 0.01.

TABLE A-2

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUAL 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

MEAN-ADJUSTED RETURN MODEL

SUBGROUP #1

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	2.1%	1.427	2.1%	1.427
-11	-3.2%	-1.846	-1.1%	-0.517
-10	-2.5%	-0.845	-3.6%	-1.392
-9	-4.3%	-3.067	-8.0%	-2.285*
-8	8.4%	0.929	0.4%	0.047
-7	3.2%	1.058	3.6%	0.367
-6	-10.6%	-1.347	-7.0%	-0.535
-5	2.4%	0.744	-4.6%	-0.300
-4	-3.5%	-0.742	-8.1%	-0.443
-3	-5.4%	-0.856	-13.6%	-0.731
-2	-2.5%	-0.585	-16.1%	-0.813
-1	-7.3%	-2.826*	-23.3%	-1.122
0	1.7%	0.394	-21.7%	-1.080
1	-4.8%	-1.579	-26.5%	-1.314
2	1.3%	0.488	-25.3%	-1.222
3	0.4%	0.233	-24.8%	-1.182
4	-7.3%	-3.114*	-32.1%	-1.429
5	-0.8%	-0.305	-32.9%	-1.489
6	-5.6%	-1.970	-38.0%	-1.585

*Significant at 0.01.

TABLE A-3

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUAL 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

MEAN-ADJUSTED RETURN MODEL

SUBGROUP #2

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	1.7%	1.045	1.7%	1.045
-11	-0.6%	-0.448	1.0%	0.517
-10	-1.6%	-0.769	-0.5%	-0.173
-9	5.3%	1.996	6.0%	1.450
-8	-1.7%	-0.845	3.3%	0.712
-7	-14.9%	-0.898	2.5%	0.532
-6	17.3%	1.212	3.9%	0.741
-5	-24.5%	-1.294	0.5%	0.087
-4	-3.2%	-2.490*	-3.6%	-0.612
-3	0.6%	0.341	-2.5%	-0.413
-2	-1.4%	-0.955	-4.1%	-0.729
-1	3.0%	1.111	-0.1%	-0.026
0	6.4%	2.308*	6.5%	1.161
1	-3.0%	-1.655	0.8%	0.153
2	1.6%	1.384	3.6%	0.597
3	3.0%	1.400	6.0%	1.086
4	-0.9%	-0.524	3.7%	0.594
5	0.0%	-0.003	4.7%	0.704
6	-4.6%	-1.420	-0.2%	-0.025

*Significant at 0.01.

TABLE A-4

AVERAGE (AR(t)) AND CUMULATIVE AVERAGE (CAR(t)) RESIDUAL 12 MONTHS BEFORE AND 6 MONTHS AFTER THE SELF-TENDER OFFER ANNOUNCEMENT

MEAN-ADJUSTED RETURN MODEL

SUBGROUP #3

(t)	AR(t)	T-Statistic	CAR(t)	T-Statistic
-12	1.8%	0.903	1.8%	0.903
-11	0.4%	0.219	2.4%	0.954
-10	-1.0%	-0.394	1.0%	0.324
-9	-2.1%	-1.366	0.2%	0.059
-8	-0.3%	-0.132	0.9%	0.205
-7	0.4%	0.258	1.7%	0.402
-6	-1.0%	-0.575	1.4%	0.271
-5	0.5%	0.337	2.6%	0.414
-4	4.6%	1.776	7.3%	1.193
-3	-0.2%	-0.102	6.4%	1.031
-2	0.9%	0.320	8.8%	1.226
-1	-1.1%	-0.500	8.3%	1.037
0	9.6%	3.981*	18.7%	2.323*
1	-2.5%	-0.676	15.6%	1.728
2	1.2%	0.662	17.6%	1.994
3	-1.1%	-0.634	17.0%	1.822
4	-1.9%	-0.910	15.7%	1.619
5	0.1%	0.067	15.8%	1.498
6	1.6%	0.734	18.0%	1.600

*Significant at 0.01.

TABLE A-5

ANALYSIS OF DAILY RESIDUALS AROUND THE TENDER OFFER ANNOUNCEMENT

MEAN-ADJUSTED RETURN MODEL

Part A: One Day Interval

(t)	AR_t	Standard Error	T	Positive: Negative	CAR_t	Standard Error	T
-1	3.61%	0.0088	4.119*	34:17	3.61%	0.0088	4.119*
0	1.61%	0.0067	2.409*	29:22	5.22%	0.0097	5.370*
1	0.02%	0.0018	0.101	19:32	5.24%	0.0101	5.203*

Part B: Three Day Interval

(t)	AR_t	Standard Error	T	Positive: Negative	CAR_t	Standard Error	T
-3	-0.046%	0.003	-0.151	20:31	-0.046%	0.003	-0.151
-2	0.151%	0.003	0.503	27:24	0.104%	0.003	0.311
-1	0.284%	0.005	0.563	24:27	0.039%	0.006	0.658
0	5.084%	0.008	6.046	41:10	5.47%	0.010	5.339*
1	0.379%	0.004	0.876	19:32	5.85%	0.011	5.300*
2	0.091%	0.002	0.440	21:30	5.94%	0.012	4.977*
3	-0.098%	0.001	-0.736	21:29	5.85%	0.012	4.925*

TABLE A-6
I.C. INDUSTRIES

S.I.C.: 449268
ANNOUNCEMENT DATE (T=0): 11/23/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 17.5664%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	33.568	582.5569	1504.834	166.1040	97.539	2.43
76	38.988	578.7139	1688.531	226.6841	108.653	3.03
77	36.802	626.0698	1873.252	270.6938	191.209	3.77
78	7.130	1144.916	2670.460	371.1743	460.869	4.09
79	38.300	1146.100	3734.601	464.7627	340.462	4.44
80	25.100	1022.500	4141.597	522.2966	372.400	4.97
81*	18.100	1058.500	4194.500	570.8989	311.400	5.52
GROWTH RATE:						
5 YR	-0.056	0.1191	0.224435	0.257498	0.30727	0.1539
3 YR	-0.120	0.1776	0.302738	0.244934	0.24882	0.0965
2 YR	0.876	-0.0550	0.245348	0.186232	-0.10109	0.1023
1 YR	-0.345	-0.1078	0.108979	0.123792	0.09381	0.1194
YR OF REPO.	-0.279	0.0352	0.012773	0.093055	-0.16380	0.1107

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.2	1008.5	1.22	0.0003	53.6
81.3	1002.3	1.46	0.0003	40.7
81.4*	1063.9	1.92	572.9000	17.2
GROWTH RATE:				
PRIOR QTR	-0.00614	0.196721	0	-0.240671
QTR OF REPO.	0.06146	0.315068	-	-0.577395

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-7
PENN CENTRAL

S.I.C.: 707271
ANNOUNCEMENT DATE (T=0): 06/26/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 24.6272%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
79	85.4000	461.3999	1087.299	177.4000	335.700	2.06
80	180.0000	497.7000	2013.698	281.5989	156.700	0.0001
81	91.2000	733.2000	3348.799	463.8989	626.600	5.25
82	89.3000	453.7000	3165.399	412.3999	153.900	2.73
83	317.7000	289.7998	2538.900	317.6006	292.400	0.0001
84*	37.7000	283.8999	2569.099	374.3999	168.800	3.82

GROWTH RATE:						
4 YR**	0.38880	-0.10976	0.23616	0.156738	-0.03393	-0.9165
3 YR	0.20850	-0.16495	0.08032	0.040919	0.23113	0
2 YR	0.86643	-0.37130	-0.12928	-0.172574	-0.31688	-0.9956
1 YR	2.55767	-0.36125	-0.19792	-0.229872	0.89993	-0.9999
YR OF REPO.	-0.88133	-0.02035	0.01189	0.178839	-0.42270	38199

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
83.4	739.8989	0.0001	115.3989	317.7
84.1	631.2988	0.76	100.3988	35.0
84.2	612.7988	1.22	92.5999	333.1

GROWTH RATE:				
PRIOR QTR	-0.14677	-	-0.12998	-0.889833
QTR OF REPO.	-0.02930	0.605263	-0.07767	8.5171114

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

**4TH YEAR CALCULATED DUE TO MISSING VALUES IN 1978 (DENOTED .00001)

TABLE A-8
CULBRO

S.I.C. #: 229890
ANNOUNCEMENT DATE (T=0): 3/24/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 31.4125%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	11.726	75.879	334.814	21.146	5.164	2.99
77	7.006	75.596	341.470	25.103	15.055	3.26
78	7.392	105.586	372.158	11.968	14.797	0.001
79	10.176	103.508	391.429	13.877	5.548	0.001
80	8.193	91.932	376.354	26.902	5.323	1.75
81	22.872	25.523	363.238	16.738	8.365	2.35
82*	3.585	51.393	380.334	21.601	12.216	3.56
GROWTH RATE:						
5 YR	0.142959	-0.19580	0.01643	-0.045679	0.10128	-0.0470
3 YR	0.457182	-0.37706	-0.00805	0.118298	-0.17314	12.2950
2 YR	0.499213	-0.50343	-0.03668	0.098250	0.22790	47.4767
1 YR	1.791651	-0.72237	-0.03485	-0.377818	0.57148	0.3428
YR OF REPO.	-0.84325	1.013595	0.04707	0.2905529	0.46037	0.5148

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.3	108.242	0.78	0.0001	9.587
81.4	108.168	0.76	0.0001	22.872
82.1*	101.695	1	0.0001	1.692
GROWTH RATE:				
PRIOR QTR	-0.00068	-0.02564	0	1.385731
QTR OF REPO.	-0.05984	0.31579	0	-0.926023

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-9
CYCLOPS CORPORATION

S.I.C.: 232525
ANNOUNCEMENT DATE (T=0): 6/8/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 9.1544%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	7.274	57.551	520.0439	34.156	12.279	3.32
74	3.679	50.282	652.9189	55.095	19.919	7.52
75	4.352	44.799	483.5608	26.653	15.333	-3.8
76	5.206	38.217	565.2148	34.076	14.966	4.35
77	6.144	39.621	650.4028	30.128	22.549	3.38
78	6.975	40.078	779.3450	54.400	22.067	7.41
79*	9.825	62.437	915.3608	61.436	24.147	1.35
GROWTH RATE:						
5 YR	-0.00835	-0.06981	0.084271	0.097556	0.12439	0.1741
3 YR	0.17027	-0.03643	0.172446	0.268485	0.12903	-1.2493
2 YR	0.15750	0.02406	0.174243	0.263504	0.21428	0.3051
1 YR	0.13525	0.01153	0.198249	0.805642	-0.02137	1.1923
YR OF REPO.	0.40860	0.55789	0.174525	0.129334	0.09426	-0.8178

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.4	0.20629	1.92	-	9.587
79.1	0.23274	1.73	-	22.872
79.2*	0.23242	1.81	-	1.692
GROWTH RATE:				
PRIOR QTR	0.12822	-0.09895	N/A	1.385731
QTR OF REPO.	-0.00135	0.04624	N/A	-0.926023

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-10
FIRESTONE TIRE AND RUBBER

S.I.C.: 318315
ANNOUNCEMENT DATE (T=0): 11/19/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 17.3323%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	193.01	720.365	3724.148	430.4194	200.658	2.29
76	325.82	678.070	3939.105	399.0952	169.547	1.64
77	215.80	690.300	4426.898	448.4973	204.90	1.87
78	157.20	684.100	4878.097	426.2966	230.90	-2.58
79	91.60	675.900	5284.199	439.1016	252.50	1.35
80	191.70	597.500	4850.500	250.5989	175.70	1.35
81*	378.00	416.000	4361.000	365.9990	196.00	1.36
GROWTH RATE:						
5 YR	-0.00136	-0.03670	0.05427	-0.102535	-0.02621	-0.1002
3 YR	-0.03870	-0.04698	0.03093	-0.176355	-0.04995	-0.1029
2 YR	0.104294	-0.06543	-0.00283	-0.233285	-0.12768	-
1 YR	1.092794	-0.11599	-0.08207	-0.429291	-0.30415	-
YR OF REPO.	0.97183	-0.30376	-0.10091	0.460497	0.11554	0.0074

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.2	1105	0.61	N/A	306
81.3	1087	0.4	N/A	385
81.4*	1103	0.3	N/A	378
GROWTH RATE:				
PRIOR QTR	-0.01628	-0.34426	-	0.258169
QTR OF REPO.	0.01471	-0.25	-	-0.018181

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-11
SHAPPEL

S.I.C.: 819470
ANNOUNCEMENT DATE (T=0): 6/19/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 18.5810%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	4.916	14.836	94.988	0.0001	0	2.10
74	7.116	18.601	109.743	0.0001	0	1.71
75	6.899	23.458	99.156	15.001	1.383	1.75
76	1.486	16.838	133.079	23.262	0.237	3.15
77	6.366	19.026	225.677	53.966	0.781	7.84
78	3.34	21.187	247.393	66.391	1.605	8.35
79*	2.33	58.786	309.858	81.800	0.979	8.34
GROWTH RATE:						
5 YR	-0.0744	0.0739	0.2110	13.6020	-	0.3179
3 YR	-0.2148	-0.0334	0.3563	0.6418	0.0509	0.6835
2 YR	0.4992	0.1217	0.3635	0.6894	1.6023	0.6281
1 YR	-0.4753	0.1136	0.0962	0.2302	1.0551	0.0651
YR OF REPO.	-0.3023	1.7746	0.2525	0.2321	-0.3900	-0.0012

QUARTER DATA NOT REPORTED

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-12
J. P. STEVENS

S.I.C.: 860163
ANNOUNCEMENT DATE (T=0): 9/24/86
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.4365%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
80	20.933	310.987	1915.995	113.8869	83.625	1.38
81	20.124	334.934	2031.334	123.0098	96.754	-
82	12.272	298.308	1814.313	121.5775	85.373	1.5
83	11.860	296.131	1926.135	101.9551	120.288	1.08
84	10.460	332.479	2144.182	121.7649	78.917	1.21
85	915.361	61.436	1698.284	1.3500	16.511	-0.89
86*	N/A	N/A	N/A	N/A	N/A	2.85
GROWTH RATE:						
5 YR	1.1289	-0.2770	-0.0238	-0.5881	-0.2771	-0.0840
3 YR	3.2095	-0.0218	-0.7769	-0.4217	-	-
2 YR	7.7852	-0.5445	-0.0610	-0.8849	-0.6295	-0.0922
1 YR	87.5106	0.1847	0.7920	0.0110	0.2092	-0.7355
YR OF REPO.	N/A	N/A	N/A	N/A	N/A	-3.2022

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
86.1	0.37715	0.54	N/A	N/A
86.2	0.451651	0.52	N/A	N/A
86.3*	0.422501	0.76	N/A	N/A
GROWTH RATE:				
PRIOR QTR	0.197	-0.0370	N/A	N/A
QTR OF REPO.	-0.065	0.4615	N/A	N/A

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-13
TRW

S.I.C.: 872649
ANNOUNCEMENT DATE (T=0): 9/23/85
REPURCHASE ANNOUNCEMENT PERCENTAGE: 21.9205%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	147.236	256.3	3787	4.20	N/A	4.73
79	73.929	286.6	4560	4.90	N/A	5.11
80	40.652	318.7	4984	5.60	N/A	5.49
81	175.916	326.0	5285	5.03	N/A	66.13
82	105.209	557.1	5132	9.40	N/A	5.2
83	245.196	348.0	4840	329.09	N/A	5.36
84	82.885	N/A	5369	456.106	N/A	6.96
85*	63.874	N/A	5914	346.087	N/A	-0.27
GROWTH RATE:						
5 YR	0.02313	-	0.0332	1.4761	N/A	0.06375
3 YR	-0.22186	-	0.0053	3.4926	N/A	-0.52786
2 YR	-0.11241	-	0.0228	5.9658	N/A	0.15692
1 YR	1.33056	-0.375	-0.0569	34.0096	N/A	0.03077
YR OF REPO.	-0.66196	-	0.1094	0.3860	N/A	0.29851

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
85.1	1429.3	1.48	180	N/A
85.2	1547.9	1.99	186	N/A
85.3*	1457.7	3	196.3	N/A
GROWTH RATE:				
PRIOR QTR	0.08298	0.344594	0.033333	N/A
QTR OF REPO.	-0.05827	0.507537	0.055376	N/A

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-14
WINN-DIXIE FOOD STORES

S.I.C.: 974280
ANNOUNCEMENT DATE (T=0): 5/6/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 5.8980%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	71.728	14.18	2962.164	117.4190	80.924	2.47
76	108.145	13.353	3265.915	132.0708	46.464	2.81
77	83.970	15.271	3996.697	146.3186	94.457	3.15
78	140.297	95.530	4444.253	185.0120	70.552	3.79
79	189.719	100.529	4930.535	194.1411	102.483	3.24
80	165.136	97.973	5388.976	182.7493	114.775	3.37
81*	160.019	90.217	6200.164	192.2869	108.000	3.66
GROWTH RATE:						
5 YR	0.181491	0.471926	0.127144	0.09250	0.072393	0.06411
3 YR	0.252869	0.858145	0.104761	0.07692	0.067098	0.02275
2 YR	0.084917	0.012705	0.101168	-0.00613	0.275466	-0.05703
1 YR	-0.12957	-0.02542	0.092979	-0.05867	0.119941	0.04012
YR OF REPO.	-0.03098	-0.07916	0.150527	0.05218	-0.059020	0.08605

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
80.4	1305.407	0.87	33.3982	165.136
81.1	1362.708	0.63	38.3032	163.688
81.2*	1895.125	1.14	62.2441	167.621
GROWTH RATE:				
PRIOR QTR	0.043895	-0.27586	0.146864	-0.008768
QTR OF REPO.	0.390705	0.80952	0.625036	0.024027

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-15
ZALE

S.I.C. #: 988857
ANNOUNCEMENT DATE (T=0): 6/25/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 15.6826%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	13.283	26.877	571.1448	62.708	16.403	2.40
74	9.082	23.875	600.2249	64.300	15.452	2.29
75	13.616	20.897	634.8938	71.286	17.104	2.47
76	13.547	57.812	677.8269	74.770	20.796	2.48
77	19.070	54.745	790.5559	73.616	14.938	2.11
78	15.166	55.046	904.4639	86.055	25.291	3.21
79	13.043	103.433	1041.6980	115.832	37.777	4.50
GROWTH RATE:						
5 YR	0.02687	0.15417	0.096298	0.0653461	0.090456	0.0599
3 YR	0.03659	0.38106	0.125200	0.0647740	0.139259	0.0913
2 YR	0.05807	-0.02421	0.155144	0.0728137	0.102790	0.1377
1 YR	-0.20471	0.00549	0.144085	0.1689727	0.693064	0.5213
YR OF REPO.	-0.13998	0.87903	0.151729	0.3460248	0.493693	0.4019

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.4	172.822	0.21	-5.334	15.166
79.1	175.709	0.72	629.191	13.562
79.2*	105.906	0.08	622.806	0.0001
GROWTH RATE:				
PRIOR QTR	0.016705	2.42857	-118.958	-0.105762
QTR OF REPO.	-0.39726	-0.88888	-0.01014	-0.999992

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-16
ALCO

S.I.C.: 013788
ANNOUNCEMENT DATE (T=0): 12/8/88
REPURCHASE ANNOUNCEMENT PERCENTAGE: 15.7979%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
82	13.522	173.443	2521.66	133.6543	58.299	2.72
83	6.292	152.609	2851.996	153.9802	43.531	2.80
84	8.746	158.355	2785.935	144.9241	86.187	2.56
85	8.688	202.820	3392.420	169.8118	101.187	2.79
86	13.638	220.254	3823.052	188.5662	46.024	3.22
87	14.489	307.674	4314.503	194.7012	45.636	3.07
88*	49.705	177.913	3616.513	167.4993	48.045	1.68
GROWTH RATE:						
5 YR	0.0139	0.1215	0.1134	0.0781	-0.0478	0.0245
3 YR	0.1832	0.2478	0.1570	0.1034	-0.1910	0.0624
2 YR	0.2914	0.2317	0.1277	0.0708	-0.3284	0.0490
1 YR	0.0624	0.3969	0.1285	0.0325	-0.0084	-0.0466
YR OF REPO.	2.4305	-0.4217	-0.16177	-0.1397	0.0528	-0.4528

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
88.2	937.9558	0.49	44.45	8.999
88.3	952.6548	0.64	51.07	13.562
88.4	N/A	N/A	N/A	N/A
GROWTH RATE:				
PRIOR QTR	0.015671	0.30612	0.14904	0.50706
QTR OF REPO.	N/A	N/A	N/A	N/A

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-17
CAESAR'S WORLD

S.I.C.: 127695
ANNOUNCEMENT DATE (T=0): 9/11/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 35.8306%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	25.729	232.267	601.5669	109.115	54.100	1.33
82	27.503	253.584	559.2119	90.589	30.766	0.40
83	23.998	186.140	564.6990	62.088	50.828	-0.40
84	99.689	255.090	617.2549	110.510	90.705	0.66
85	45.933	236.674	654.7319	138.890	88.471	1.07
86	168.594	331.897	688.2249	149.464	53.085	1.33
87*	86.083	91.536	779.6929	178.890	47.233	1.24
GROWTH RATE:						
5 YR	0.45641	0.07400	0.02728	0.06495	-0.00378	0
3 YR	0.91524	0.21261	0.06816	0.34022	0.01459	-2.4926
2 YR	0.30046	0.14066	0.05592	0.16297	-0.23498	0.4196
1 YR	2.67043	0.40234	0.05116	0.07613	-0.39997	0.2430
YR OF REPO.	-0.48940	-0.72420	0.13290	0.19688	-0.11023	-0.0677

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.1	195.503	0.46	47.253	178.76
87.2	190.052	0.38	41.976	168.86
87.3*	196.065	0.33	47.085	190.06
GROWTH RATE:				
PRIOR QTR	-0.02788	-0.17391	-0.11167	-0.055359
QTR OF REPO.	0.03163	-0.13157	0.12171	0.125521

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-18
COCA-COLA BOTTLING CORP.

S.I.C.: 191216
ANNOUNCEMENT DATE (T=0): 03/18/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: .5663%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	385.9426	9.022	2872.839	520.2341	143.264	4.00
76	361.8718	7.857	3032.828	586.7368	182.165	4.76
77	347.8518	13.762	3559.876	678.4583	260.9138	2.67
78	321.491	15.231	4337.914	773.1145	306.022	3.03
79	148.571	30.989	4961.390	836.3132	409.2908	3.40
80	231.086	133.221	5912.582	906.4202	297.9888	3.42
81*	339.5417	137.278	5889.023	943.4749	329.606	3.62
GROWTH RATES:						
5 YR	-0.09749	0.713381	0.155295	0.1174449	0.15774	-0.031
3 YR	-0.12744	1.131230	0.184261	0.1013756	0.04528	0.0860
2 YR	-0.15218	1.073397	0.091658	0.0410709	-0.14673	0.0029
1 YR	0.55539	3.298977	0.191718	0.0838286	-0.27193	0.0059
YR OF REPO.	0.46933	0.03045	-0.00398	0.0408802	0.10610	0.0585

QUARTERLY ANALYSIS:

QTR.	NET SALES	EPS	OPERATING INCOME	CASH
80.3	1418.383	0.78	N/A	227.264
80.4	1437.176	0.72	N/A	231.086
81.1*	1346.461	0.79	N/A	211.127
GROWTH RATE:				
PRIOR QTR	0.01324	-0.07692	-	0.016817
QTR OF REPO	-0.06312	0.09722	-	-0.086370

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-19
COLGATE-PALMOLIVE

S.I.C.: 194162
ANNOUNCEMENT DATE (T=0): 8/16/85
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.4561%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
79	197.281	309.956	4494.460	417.4016	137.882	2.29
80	339.429	303.246	5130.460	477.8196	117.081	2.40
81	445.461	303.226	5261.359	487.3989	107.249	2.55
82	573.374	255.835	4887.984	432.7927	139.150	2.41
83	526.493	292.945	4864.789	395.7559	182.541	2.42
84	351.698	282.371	4909.953	360.1914	243.788	0.64
85*	259.461	529.255	4523.644	347.7747	298.308	2.11
GROWTH RATE:						
5 YR	0.12258	-0.01846	0.01784	-0.02905	0.12073	-0.2251
3 YR	-0.07575	-0.02347	-0.02277	-0.09590	0.31484	-0.3692
2 YR	-0.21681	0.05058	0.00224	-0.08772	0.32362	-0.4847
1 YR	-0.33199	-0.03609	0.00928	-0.08986	0.33552	-0.7355
YR OF REPO.	-0.26226	0.87433	-0.07867	-0.03447	0.22364	2.2968

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
85.1	1116.88	0.55	100.863	302.6379
85.2	1122.008	0.59	100.060	270.5320
85.3	1135.937	0.56	90.446	306.0188
GROWTH RATE:				
PRIOR QTR	0.00459	0.07273	-0.00796	-0.10609
QTR OF REPO.	0.01241	-0.05084	-0.09608	0.13117

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-20
DI GIORGIO

S.I.C.: 252435
ANNOUNCEMENT DATE (T=0): 1/20/88
REPURCHASE ANNOUNCEMENT PERCENTAGE: 5.8779%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	1.288	95.315	891.488	34.8449	8.393	1.31
82	1.332	106.415	920.577	27.1170	18.448	0.92
83	2.518	123.623	1019.977	30.6328	18.165	1.15
84	11.129	116.777	1036.480	28.6250	12.644	0.95
85	4.325	106.872	1093.125	38.2981	11.735	1.51
86	3.468	83.622	1100.423	40.8950	11.518	1.51
87	2.698	94.776	949.934	29.0289	5.569	1.24
GROWTH RATE:						
5 YR	0.21908	-0.02583	0.04301	0.03254	0.06535	0.02882
3 YR	0.11261	-0.12217	0.02563	0.10110	-0.14089	0.09503
2 YR	-0.44177	-0.15378	0.03038	0.19526	-0.04556	0.26074
1 YR	-0.19815	-0.21754	0.00668	0.06781	-0.01849	0
YR OF REPO.	-0.22202	0.13339	-0.13675	-0.29016	-0.51649	-0.17880

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.3	233.01	0.22	0.0002	2.612
87.4	249.095	0.39	0.0001	2.698
88.1*	243.055	0.26	5.984	1.536
GROWTH RATE:				
PRIOR QTR	0.06903	0.7727	-0.500	0.0329
QTR OF REPO.	-0.02424	-0.3333	59839	-0.4307

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-21
GEN CORP

S.I.C.: 368682
ANNOUNCEMENT DATE (T=0): 4/8/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 55.9662%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	96.914	248.098	2175.212	122.188	88.100	2.73
82	91.712	169.280	2061.657	129.717	91.139	1.15
83	168.985	272.929	2184.348	189.452	84.744	3.28
84	152.249	312.147	2727.060	224.954	147.638	0.33
85	253.300	254.670	3020.747	265.756	160.777	2.22
86	192.000	198.000	3099.000	316.000	189.000	5.82
87*	41.000	473.000	1619.000	183.000	102.000	1.12
GROWTH RATE:						
5 YR	0.1465	-0.0440	0.0734	0.2094	0.16492	0.1635
3 YR	0.0435	-0.1015	0.1237	0.1859	0.30652	0.2106
2 YR	0.1230	-0.2036	0.0660	0.1852	0.13144	3.1996
1 YR	-0.2420	-0.2225	0.0259	0.1891	0.17559	1.6216
YR OF REPO.	-0.7865	1.3889	-0.4776	-0.4209	-0.46032	-0.8076

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
86.4	511	0.90	52	192
87.1	302	0.48	33	154
87.2	450	-1.25	48	60
GROWTH RATE:				
PRIOR QTR	-0.40900	-0.46666	-0.36538	-0.197916
QTR OF REPO.	0.49007	-3.60416	0.45455	-0.610389

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-22
SMITH-KLINE BECKMAN

S.I.C.: 832377
ANNOUNCEMENT DATE (T=0): 11/28/86
REPURCHASE ANNOUNCEMENT PERCENTAGE: 19.4112%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
80	307.244	136.268	1771.937	496.753	147.466	4.65
81	393.798	153.396	1985.340	584.035	220.332	5.55
82	440.220	195.322	2968.665	757.838	304.784	5.51
83	599.539	89.326	2835.388	791.741	232.914	5.85
84	584.900	87.000	2949.199	800.500	241.500	6.19
85	772.000	102.400	3256.599	861.200	332.300	6.56
86*	433.500	71.400	3745.399	922.100	265.500	6.78
GROWTH RATES:						
5 YR	0.2024	-0.0555	0.1294	0.11633	0.1764	0.0712
3 YR	0.2059	-0.1937	0.0313	0.04354	0.0292	0.0599
2 YR	0.1347	0.0707	0.0717	0.04294	0.1944	0.0589
1 YR	0.3199	0.1770	0.1042	0.07583	0.0485	0.0466
YR OF REPO.	-0.4385	-0.3027	0.1501	0.07072	-0.2010	0.0335

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
86.2	882.6	1.59	N/A	777.4
86.3	956.4	1.74	N/A	723.6
86.4*	1043.3	1.94	N/A	433.5
GROWTH RATES:				
PRIOR QTR	0.0836	0.09434	-	-0.069205
QTR OF REPO.	0.0909	0.11494	-	-0.400912

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-23
STANDARD BRANDS PAINTS

S.I.C.: 853156
ANNOUNCEMENT DATE (T=0): 11/11/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 53.7297%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	13.089	7.887	220.027	30.585	16.509	2.85
82	8.790	7.262	250.723	32.900	17.358	2.73
83	6.173	11.002	296.814	40.789	17.710	1.68
84	6.714	10.768	314.927	42.213	22.459	1.87
85	18.466	39.196	337.968	32.445	22.762	1.40
86	14.417	36.002	326.609	34.277	24.521	1.33
87*	3.696	185.693	305.475	35.554	15.893	0.79
GROWTH RATE:						
5 YR	0.01952	0.35482	0.082207	0.02305	0.0823	-0.1414
3 YR	0.32676	0.48463	0.032399	-0.05633	0.1146	-0.0749
2 YR	0.46536	0.82850	0.018378	-0.09888	0.0449	-0.1567
1 YR	-0.21926	-0.08148	-0.033600	0.05647	0.0773	-0.0500
YR OF REPO.	-0.74363	4.15785	-0.06470	0.03725	-0.3519	-0.4060

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.2	92.582	0.48	11.414	8.850
87.3	71.513	0.39	0.0002	5.731
87.4*	68.932	-0.42	16.261	3.696
GROWTH RATE:				
PRIOR QTR	-0.22757	-0.1875	-0.99998	-0.352429
QTR OF REPO.	-0.03609	-2.0769	81304	-0.355086

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-24
L. S. STARRETT

S.I.C.: 855668
ANNOUNCEMENT DATE (T=0): 11/8/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 21.4159%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	8.633	0.763	76.833	19.521	2.201	4.04
79	8.864	0.052	92.938	23.449	4.779	5.65
80	13.512	-	110.297	24.633	4.888	6.26
81	14.537	-	122.451	26.979	3.817	3.52
82	19.613	-	112.742	21.661	3.389	2.92
83	16.594	-	88.520	14.238	2.472	1.61
84*	22.055	-	105.843	19.372	3.683	2.27
GROWTH RATE:						
5 YR	0.139614	-	0.02872	-0.06116	0.02349	-0.16806
3 YR	0.070887	-	-0.07069	-0.16700	-0.20327	-0.36405
2 YR	0.068410	-	-0.14976	-0.27354	-0.19524	-0.32369
1 YR	-0.15392	-	-0.21484	-0.34268	-0.27058	-0.44863
YR OF REPO.	0.329094	-	0.19570	0.360584	0.48989	0.40994

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
84.2	25.924	0.50	8.747	17.104
84.3	26.804	0.63	5.144	17.744
84.4	30.483	0.76	7.461	22.055
GROWTH RATE:				
PRIOR QTR	0.03395	0.26	-0.41191	0.037418
QTR OF REPO.	0.13726	0.206349	0.450427	0.242955

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-25
TEKTRONIX

S.I.C. #: 879131
ANNOUNCEMENT DATE (T=0): 6/9/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 25.9544%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	73.331	132.060	1195.747	202.9202	102.41	4.25
82	96.867	152.342	1191.379	181.1650	104.72	2.57
83	164.297	169.618	1331.308	211.2251	95.125	6.15
84	232.557	92.103	1438.081	206.8140	79.296	4.41
85	258.396	10.935	1352.211	152.6172	84.765	1.97
86	242.735	50.857	1395.884	185.1108	66.819	1.33
87*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
GROWTH RATE:						
5 YR	0.27048	-0.17374	0.03144	-0.01820	-0.08185	-0.20732
3 YR	0.13894	-0.33069	0.01591	-0.04304	-0.11106	-0.39975
2 YR	0.02165	-0.25691	-0.01478	-0.05392	-0.08203	-0.45083
1 YR	-0.06060	3.65085	0.03230	0.21291	-0.21171	-0.32487
YR OF REPO.	N/A	N/A	N/A	N/A	N/A	N/A

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
86.4	355.3359	0.02	50.8199	242.735
87.1	299.5159	0.05	20.1709	78.484
87.2	318.5549	0.15	39.7669	48.297
GROWTH RATE:				
PRIOR QTR	-0.15709	1.5	-0.60309	-0.676667
QTR OF REPO.	0.06356	2	0.97150	-0.384626

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-26
EMPIRE

S.I.C.: 292004
ANNOUNCEMENT DATE (T=0): 11/2/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 28.3571%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	0.0001	0.0001	73.4064	0.0001	0.0001	1.45
76	0.0001	0.0001	788.4096	0.0001	0.0001	1.07
77	0.0001	0.0001	116.4027	0.0001	0.0001	1.77
78	0.0001	0.0001	128.9442	0.0001	0.0001	2.01
79	0.0001	0.0001	184.1612	0.0001	0.0001	3.11
80	0.0001	0.0001	357.3995	0.0001	0.0001	2.04
81*	0.0001	0.0001	284.5481	0.0001	0.0001	-0.1
GROWTH RATE:						
5 YR	0	0	0.372410	0	0	0.07066
3 YR	0	0	0.453439	0	0	0.04846
2 YR	0	0	0.664853	0	0	0.00743
1 YR	0	0	0.940687	0	0	-0.34405
YR OF REPO.	0	0	-0.20383	0	0	-1.04901

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.2	65.751	0.93	N/A	N/A
81.3	74.446	0.63	N/A	N/A
81.4*	54.111	-1.31	N/A	N/A
GROWTH RATE:				
PRIOR QTR	0.13224	-0.32258		
QTR OF REPO.	-0.27315	-3.07936		

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-27
ETHYL CORPORATION

S.I.C.: 297659
ANNOUNCEMENT DATE (T=0): 10/30/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 23.7156%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	174.063	239.789	1422.45	224.7189	100.470	4.02
79	119.049	221.966	1656.976	242.3699	128.641	4.77
80	108.932	203.415	1740.625	220.1616	161.338	4.39
81	120.994	172.043	1757.193	221.7074	140.520	4.48
82	93.962	359.250	1614.625	228.8101	97.461	4.50
83	72.952	293.328	1745.191	273.0188	84.723	2.56
84*	69.313	420.831	1675.058	267.6299	103.416	3.40
GROWTH RATE:						
5 YR	-0.15963	0.04113	0.0417	0.039706	-0.03351	-0.08630
3 YR	-0.12509	0.12977	0.0008	0.074361	-0.19322	-0.16454
2 YR	-0.22350	0.30574	-0.0034	0.109701	-0.22351	-0.24407
1 YR	-0.22360	-0.18349	0.0808	0.193211	-0.13069	-0.43111
YR OF REPO.	-0.04988	0.43467	-0.0401	-0.019738	0.22063	0.32810

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
84.2	446.457	0.90	69.879	83.889
84.3	423.342	0.87	71.746	115.033
84.4*	387.185	1.06	71.204	69.313
GROWTH RATE:				
PRIOR QTR	-0.05177	-0.03333	0.02671	0.371252
QTR OF REPO.	-0.08540	0.21839	-0.00755	-0.397451

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-28
FAR WEST FINANCIAL

S.I.C.: 307351
ANNOUNCEMENT DATE (T=0): 12/7/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 17.7333%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	71.511	118.597	115.753	11.968	3.424	-2.42
82	113.44	210.353	120.505	9.605	2.619	-8.51
83	276.918	135.462	149.387	26.976	0.0001	2.80
84	578.737	405.027	238.270	57.177	2.187	6.31
85	652.224	452.249	287.449	94.346	0.599	7.89
86	588.847	520.751	344.460	109.966	1.344	3.01
87*	641.016	563.451	368.997	85.798	2.464	0.54
GROWTH RATE:						
5 YR	0.52449	0.344346	0.243716	0.558287	-0.17058	-2.0446
3 YR	0.28593	0.566525	0.321120	0.597449	22.77568	0.0244
2 YR	0.00870	0.133895	0.202362	0.386815	-0.21607	-0.3093
1 YR	-0.09717	0.151470	0.198337	0.165561	1.24374	-0.6185
YR OF REPO.	0.088595	0.081996	0.071232	-0.219778	0.83333	-0.8206

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.2	86.823	0.71	0.0001	569.6558
87.3	93.939	0.72	30.811	637.8879
87.4*	86.028	-1.93	-10.466	641.0159
GROWTH RATE:				
PRIOR QTR	0.08195	0.014084	-	0.119778
QTR OF REPO.	-0.08421	-3.68055	-1.33968	0.004904

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-29
GEICO CORPORATION

S.I.C.: 361582
ANNOUNCEMENT DATE (T=0): 3/3/88
REPURCHASE ANNOUNCEMENT PERCENTAGE: 6.0344%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	8.53	136.972	723.0698	0.0001	0.0001	2.98
82	8.817	143.902	814.4619	0.0001	0.0001	3.67
83	15.074	153.268	868.5559	0.0001	0.0001	4.48
84	11.163	184.439	988.1858	0.0001	0.0001	5.11
85	15.712	182.566	1211.942	0.0001	0.0001	4.21
86	13.093	163.764	1418.792	0.0001	0.0001	6.91
87	17.419	165.929	1570.048	0.0001	0.0001	9.01
GROWTH RATE:						
5 YR	0.08948	0.03638	0.144320	0	0	0.183184
3 YR	-0.04587	0.02233	0.177715	0	0	0.155402
2 YR	0.08300	-0.05771	0.198229	0	0	0.162863
1 YR	-0.16668	-0.10298	0.170676	0	0	0.641330
YR OF REPO.	0.330405	0.013220	0.106609	0	0	0.303907

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.4	413.6758	2.33	50.5779	68.874
88.1	413.2039	2.01	34.4819	27.013
88.2	0.0001	2.27	0.0001	0.0001
GROWTH RATE:				
PRIOR QTR	-0.00114	-0.1373	-0.31824	-0.607791
QTR OF REPO.	N/A	0.112	N/A	N/A

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-30
GOLDEN NUGGETT

S.I.C.: 381136
ANNOUNCEMENT DATE (T=0): 9/10/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 29.0178%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	141.763	200.011	239.002	67.566	38.594	3.79
82	104.969	202.337	272.902	77.246	71.763	3.59
83	342.6167	370.344	369.981	115.046	106.610	1.09
84	226.638	339.213	384.875	80.963	133.274	0.23
85	420.610	583.000	385.023	67.517	67.856	0.65
86	234.815	505.975	381.748	66.352	176.334	0.10
87*	175.937	213.219	194.237	30.400	37.141	4.14
GROWTH RATE:						
5 YR	0.10620	0.20397	0.09818	-0.00362	0.35507	-0.51663
3 YR	-0.11833	0.10962	0.01049	-0.16760	0.18262	-0.54898
2 YR	0.01788	0.22132	-0.00407	-0.09471	0.15025	-0.34061
1 YR	-0.44172	-0.13211	-0.00850	-0.01725	1.59865	-0.84615
YR OF REPO.	-0.25074	-0.57859	-0.49119	-0.54183	-0.7893	40.4

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.1	78.8	3.76	16.611	304.6548
87.2	38.367	0.02	2.705	353.3848
87.3*	39.388	0.09	4.649	349.7168
GROWTH RATE:				
PRIOR QTR	-0.51310	-0.9947	-0.83715	0.159952
QTR OF REPO.	0.02661	3.5000	0.71867	-0.010379

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-31
HOLIDAY INNS

S.I.C.: 435071
ANNOUNCEMENT DATE (T=0): 1/14/85
REPURCHASE ANNOUNCEMENT PERCENTAGE: 27.9374%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
79	161.213	311.301	1112.644	215.909	174.977	0.0001
80	121.225	564.612	1533.757	289.427	519.502	0.0001
81	71.824	639.581	1765.108	352.356	301.338	3.66
82	82.489	436.356	1425.297	295.374	209.585	2.50
83	53.681	482.735	1585.079	362.185	345.195	3.28
84	65.163	789.585	1790.844	427.147	455.918	3.59
85*	72.387	1087.761	1890.940	497.418	425.926	5.05
GROWTH RATE:						
5 YR	-0.16570	0.204601	0.099867	0.14620	0.21110	-
3 YR	-0.03192	0.072756	0.004836	0.06626	0.14800	-0.00641
2 YR	-0.11120	0.345176	0.120924	0.20254	0.47490	0.19833
1 YR	0.21389	0.635648	0.129813	0.17936	0.32075	0.09451
YR OF REPO.	0.11086	0.377634	0.055893	0.16451	-0.06580	0.40668

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
84.3	473.948	1.37	145.202	64.632
84.4	429.451	0.59	94.497	65.163
85.1*	N/A	N/A	N/A	N/A
GROWTH RATE:				
PRIOR QTR	-0.09388	-0.56934	-0.34920	0.00823
QTR OF REPO.	-	-	-	-

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-32
HOSPITAL CORPORATION

S.I.C. #: 441065
ANNOUNCEMENT DATE (T=0): 9/18/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.6634%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	50.463	1648.835	2063.636	380.003	981.409	2.23
82	50.693	1604.973	2976.911	555.902	615.797	2.97
83	60.871	1706.420	3202.985	660.768	649.265	2.77
84	81.140	1830.643	3498.643	835.588	550.331	3.31
85	103.092	2763.239	4352.304	858.980	672.132	3.11
86	150.263	3066.892	4930.648	806.960	601.937	2.08
87	933.898	2222.937	4675.875	772.211	535.038	-0.71
GROWTH RATE:						
5 YR	0.24387	0.132150	0.190293	0.162554	-0.09314	-0.01383
3 YR	0.35149	0.215824	0.154648	0.068894	-0.02491	-0.09107
2 YR	0.36084	0.294337	0.187140	-0.017279	0.04584	-0.20728
1 YR	0.45756	0.109890	0.132882	-0.060559	-0.10443	-0.33118
YR OF REPO.	5.215088	-0.2751	-0.05167	-0.043062	-0.11113	-1.34134

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.1	1297.405	0.98	273.161	129.677
87.2	1294.798	0.74	250.531	93.374
87.3*	1160.564	-2.83	0	1250.597
GROWTH RATE:				
PRIOR QTR	-0.00200	-0.24489	-0.08284	-0.279949
QTR OF REPO.	-0.10367	-4.82432	-1	12.393417

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-33
JEWELCOR

S.I.C.: 477205
ANNOUNCEMENT DATE (T=0): 4/4/85
REPURCHASE ANNOUNCEMENT PERCENTAGE: 27.3583%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
79	5.651	22.496	168.496	11.668	4.799	0.41
80	7.182	20.454	171.591	11.445	3.433	0.0001
81	4.960	26.920	171.085	9.848	2.406	0.17
82	4.558	25.394	182.092	9.564	7.954	0.39
83	4.508	20.775	195.735	11.413	3.022	0.51
84	2.271	21.170	229.376	13.505	7.437	0.48
85*	6.772	20.969	251.815	16.868	3.031	1.30
GROWTH RATE:						
5 YR	-0.16666	-0.01207	0.063632	0.029674	0.09156	0.032027
3 YR	-0.22925	-0.07697	0.102669	0.111004	0.45669	0.413396
2 YR	-0.29413	-0.08694	0.122350	0.188304	-0.03304	0.109400
1 YR	-0.49622	0.01901	0.171870	0.183300	1.46095	-0.058820
YR OF REPO.	1.98194	-0.00949	0.097826	0.24902	-0.59244	1.708333

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
84.4	89.685	0.54	8.743	2.271
85.1	N/A	N/A	N/A	154
85.2	N/A	N/A	N/A	N/A
GROWTH RATE:				
PRIOR QTR	-	-	-	66.811536
QTR OF REPO.	-	-	-	-

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-34
LIBERTY

S.I.C. #: 530370
ANNOUNCEMENT DATE (T=0): 9/16/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 23.4076%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	22.14	15.196	165.961	0.0001	0.0001	2.94
77	24.37	18.050	194.905	0.0001	0.0001	3.47
78	25.61	8.524	255.217	0.0001	0.0001	4.60
79	28.29	14.535	272.275	0.0001	0.0001	2.56
80	23.58	23.803	300.006	0.0001	0.0001	2.32
81	12.41	7.787	302.882	0.0001	0.0001	2.24
82*	3.97	94.703	264.820	0.0001	0.0001	1.22
GROWTH RATE:						
5 YR	-0.10934	-0.12516	0.127855	0	0	-0.05293
3 YR	-0.21460	-0.02969	0.058736	0	0	-0.21326
2 YR	-0.33773	-0.26805	0.054709	0	0	-0.06458
1 YR	-0.47374	-0.67285	0.009586	0	0	-0.03448
YR OF REPO.	-0.68007	11.16167	-0.12566	0	0	-0.45535

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.4	0.0001	0.52	0.0001	0.0001
82.1	59.672	0.24	9.529	3.369
82.2	62.198	0.45	12.179	4.872
GROWTH RATE:				
PRIOR QTR	N/A	-0.538	-	-
QTR OF REPO.	0.042331	0.875	0.2781	0.44612

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-35
MARRIOTT CORPORATION

S.I.C. #: 571630
ANNOUNCEMENT DATE (T=0): 1/24/80
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.6169%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
74	23.781	286.0828	640.439	84.252	119.062	0.78
75	24.808	362.2639	732.396	87.019	161.398	0.66
76	20.753	382.2678	890.403	108.638	149.421	0.88
77	24.726	342.0918	1026.312	132.742	73.171	0.97
78	53.257	338.0640	1249.594	166.131	136.741	1.43
79	21.270	392.1968	1509.956	201.608	158.601	1.95
80*	27.436	561.1570	1718.724	222.771	239.087	2.60
GROWTH RATE:						
5 YR	-0.02207	0.065129	0.187127	0.1906536	0.05903	0.201124
3 YR	0.00824	0.008584	0.192502	0.2288778	0.02007	0.303718
2 YR	-0.07251	0.070731	0.212948	0.2323931	0.47226	0.417853
1 YR	-0.60061	0.160125	0.208357	0.2135477	0.15986	0.363636
YR OF REPO.	0.28989	0.430804	0.138260	0.1049705	0.50747	0.333333

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
79.3	396.303	0.70	0.0001	36.644
79.4	457.6648	0.51	0.0001	21.270
80.1*	350.4409	0.40	0.0001	22.777
GROWTH RATE:				
PRIOR QTR	0.15484	-0.27142	N/A	-0.419550
QTR OF REPO.	-0.23428	-0.21568	N/A	0.070851

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-36
PACIFIC LUMBER

S.I.C.: 694529
ANNOUNCEMENT DATE (T=0): 9/14/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 10.356%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	45.789	1.926	208.021	68.168	13.358	3.41
79	12.846	5.285	258.434	77.003	30.602	4.06
80	11.062	17.492	289.526	68.224	38.288	3.48
81	8.455	17.260	303.231	64.726	34.817	2.09
82	8.035	15.818	235.601	43.213	18.441	0.96
83	15.344	8.839	239.549	54.311	19.660	1.17
84	6.423	46.000	280.748	74.170	33.634	1.88
GROWTH RATE:						
5 YR	-0.19640	0.35628	0.02863	-0.04443	0.08036	-0.1926
3 YR	0.11524	-0.20349	-0.06120	-0.07320	-0.19923	-0.3047
2 YR	0.34714	-0.28438	-0.11118	-0.08398	-0.24855	-0.2518
1 YR	0.90965	-0.44120	0.01676	0.25682	0.06610	0.2188
YR OF REPO.	-0.58139	4.20421	0.17198	0.36565	0.71078	0.6068

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
84.1	0.069953	0.56	69.879	83.889
84.2	0.074725	0.56	71.746	115.033
84.3*	0.070090	0.47	71.204	69.313
GROWTH RATE:				
PRIOR QTR	0.06822	0	0.02672	0.371252
QTR OF REPO.	-0.06202	-0.16071	-0.00755	-0.397451

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-37
POGO PRODUCING

S.I.C.: 730448
ANNOUNCEMENT DATE (T=0): 4/28/83
REPURCHASE ANNOUNCEMENT PERCENTAGE: 25.9486%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
77	14.418	16.027	90.065	76.051	65.771	0.92
78	2.919	70.565	144.347	123.717	80.036	1.37
79	5.548	116.433	159.212	137.953	151.072	1.66
80	4.183	206.709	220.394	177.509	247.861	2.13
81	6.184	306.764	295.995	222.516	288.560	2.60
82	4.690	434.200	277.983	214.146	321.062	2.05
83*	10.019	399.750	232.418	169.862	197.387	0.88
GROWTH RATE:						
5 YR	-0.20117	0.93449	0.25283	0.23005	0.37313	0.17380
3 YR	-0.05446	0.55074	0.20415	0.15787	0.28569	0.07287
2 YR	0.05887	0.44932	0.12308	0.09836	0.13813	-0.01895
1 YR	-0.24159	0.41542	-0.06085	-0.03762	0.11264	-0.21153
YR OF REPO.	1.13625	-0.07934	-0.16391	-0.20679	-0.38520	-0.57073

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
82.4	65.211	0.44	49.04	4.69
83.1	59.297	0.29	42.70	3.79
83.2*	52.506	0.08	36.33	5.26
GROWTH RATE:				
PRIOR QTR	-0.09069	-0.34090	-0.12929	-0.191044
QTR OF REPO.	-0.11452	-0.72413	-0.14911	0.387190

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-38
PUEBLO

S.I.C.: 744897
ANNOUNCEMENT DATE (T=0): 1/14/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 11.25%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	5.880	25.433	628.9399	7.7110	5.069	0.0001
76	7.439	17.186	546.1238	10.9328	4.616	0.0001
77	8.130	15.284	335.6799	10.6361	4.762	0.54
78	4.177	36.797	296.1699	13.7319	10.345	0.88
79	8.960	35.268	330.7729	14.9470	5.877	0.89
80	16.392	31.939	396.5999	14.1690	6.835	0.74
81*	28.052	34.691	452.8230	13.8812	12.100	1.95
GROWTH RATE:						
5 YR	0.22758	0.04661	-0.08809	0.129395	0.06161	4.94082
3 YR	0.26332	0.27848	0.05716	0.100320	0.12802	0.11074
2 YR	0.98099	-0.06834	0.15719	0.015791	-0.18716	-0.08298
1 YR	0.82946	-0.09439	0.19901	-0.052050	0.16301	-0.16853
YR OF REPO.	0.71132	0.08616	0.14176	-0.020311	0.77030	1.63514

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
80.3	98.489	0.17	3.407	3.407
80.4	117.579	0.30	4.541	16.392
81.1*	109.043	0.20	3.510	14.828
GROWTH RATE:				
PRIOR QTR	0.19383	0.76471	0.33284	3.811271
QTR OF REPO.	-0.07259	-0.33333	-0.22704	-0.095412

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-39
SEDCO

S.I.C.: 815246
ANNOUNCEMENT DATE (T=0): 2/18/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 27.8148%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	26.114	210.346	331.3289	104.6399	90.486	4.33
77	30.987	235.199	343.3369	114.9569	110.311	4.93
78	18.462	254.638	382.6558	121.4318	115.204	4.24
79	36.111	219.598	368.9048	88.7458	87.422	1.15
80	23.094	226.271	372.9038	99.6538	68.856	1.24
81	51.751	264.719	362.6038	141.0458	187.121	2.08
82*	78.799	242.575	522.6460	247.6559	124.991	8.62
GROWTH RATE:						
5 YR	0.14659	0.047056	0.01820	0.061531	0.15640	-0.13639
3 YR	0.40998	0.013026	-0.01778	0.051177	0.17549	-0.21132
2 YR	0.19713	0.097939	-0.00857	0.260684	0.46302	0.34488
1 YR	1.24089	0.169920	-0.02762	0.415358	1.71757	0.67742
YR OF REPO.	0.52266	-0.08365	0.44136	0.755854	-0.33203	3.14423

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.3	94.274	0	41.271	
81.4	114.318	0	46.160	3.794
82.1*	127.500	1.43	69.097	5.263
GROWTH RATE:				
PRIOR QTR	0.212614	0	0.118460	
QTR OF REPO.	0.115309	0	0.496902	0.3871903

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-40
USF & G

S.I.C.: 90329
ANNOUNCEMENT DATE (T=0): 9/8/83
REPURCHASE ANNOUNCEMENT PERCENTAGE: 6.9329%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
77	23.459	0	1640.941	0.0001	0.0001	6.38
78	32.141	0	1938.265	0.0001	0.0001	7.75
79	43.166	0	2136.230	0.0001	0.0001	8.22
80	43.707	0	2252.943	0.0001	0.0001	8.16
81	51.071	0	2336.647	0.0001	0.0001	5.97
82	50.315	0	2305.972	0.0001	0.0001	3.98
83	37.851	0	2386.892	0.0001	0.0001	0.0001

GROWTH RATE:

5 YR	0.164870	0	0.070415	0	0	-0.09006
3 YR	0.052410	0	0.025814	0	0	-0.21475
2 YR	0.072934	0	0.011700	0	0	-0.30161
1 YR	-0.014800	0	-0.013120	0	0	-0.33333
YR OF REPO.	-0.24771	0	0.035091	0	0	-0.99997

QUARTERLY ANALYSIS:

QUARTER DATA NOT AVAILABLE

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-41
STANDARD OIL OF OHIO (SOHIO)

S.I.C.: 853734
ANNOUNCEMENT DATE (T=0): 7/27/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 1.5661%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	152.716	413.498	1481.993	154.434	192.597	2.02
74	117.764	804.944	2166.175	206.962	700.411	3.44
75	83.583	1949.172	2484.159	252.389	1641.614	3.40
76	165.443	3626.846	2911.695	301.818	1698.798	3.53
77	187.784	4687.562	3523.222	618.096	1104.398	4.36
78	417.396	4397.632	5197.710	1522.956	762.251	3.99
79*	1283.271	3822.395	7916.019	2900.282	601.959	9.77
GROWTH RATE:						
5 YR	0.22274	0.60453	0.285266	0.580479	0.31671	0.14584
3 YR	0.70927	0.31156	0.279020	0.820561	-0.22564	0.05479
2 YR	0.58836	0.10115	0.336081	1.246316	-0.33014	0.06316
1 YR	1.22274	-0.06185	0.475271	1.463944	-0.30980	-0.08486
YR OF REPO.	2.07447	-0.13080	0.522982	0.904377	-0.21028	1.44862

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
79.1	1650.500	1.39	473.7	4.690
79.2	1818.000	1.68	871.4	3.794
79.3*	2097.801	3.03	850.7	5.263
GROWTH RATE:				
PRIOR QTR	0.101484	0.208633	0.83956	-0.191044
QTR OF REPO.	0.153905	0.803571	-0.02375	0.387190

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-42
WINN-DIXIE FOOD STORES

S.I.C.: 974280
ANNOUNCEMENT DATE (T=0): 6/25/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 10.7861%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	42.565	2.99	2109.737	89.525	48.754	1.89
74	56.623	3.81	2528.012	111.128	41.652	2.28
75	71.728	14.18	2962.164	117.419	80.924	2.47
76	108.145	13.35	3265.915	132.071	46.464	2.81
77	83.970	15.27	3996.697	146.319	94.457	3.15
78	140.297	95.53	4444.253	185.012	70.552	3.79
79*	189.719	100.53	4930.535	194.141	102.483	3.24
GROWTH RATE:						
5 YR	0.26940	0.99937	0.160684	0.1562483	0.07671	0.14931
3 YR	0.25060	0.88866	0.144800	0.1636449	-0.04469	0.15340
2 YR	0.13899	1.67473	0.166532	0.1835770	0.23224	0.16136
1 YR	0.67080	5.25565	0.111981	0.2644462	-0.25307	0.20317
YR OF REPO.	0.35227	0.05233	0.109418	0.0493432	0.452588	-0.14511

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.4	1054.782	1.13	50.235	140.297
79.1	1085.378	0.89	43.000	164.752
79.2*	1498.057	0.87	56.057	156.174
GROWTH RATE:				
PRIOR QTR	0.029006	-0.21238	-0.14401	0.174309
QTR OF REPO.	0.380216	-0.02247	0.30365	-0.052066

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-43
BEMIS

S.I.C. #: 081437
ANNOUNCEMENT DATE (T=0): 9/05/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 21.1267%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	8.529	74.525	514.5840	45.637	40.205	2.84
74	4.462	80.377	609.6609	60.600	16.828	3.87
75	4.863	72.009	540.8608	39.435	17.420	1.53
76	7.377	65.786	608.9358	48.903	25.441	2.86
77	5.112	69.033	636.0559	52.319	40.671	3.09
78	4.124	91.685	676.8608	58.194	36.053	3.57
79*	25.198	78.765	648.4749	50.284	48.534	3.24
GROWTH RATE:						
5 YR	-0.13526	0.042315	0.05635	0.0498169	-0.02156	0.046815
3 YR	-0.05346	0.083853	0.07763	0.1385034	0.274376	0.326352
2 YR	-0.25231	0.180544	0.05429	0.0908743	0.190429	0.117251
1 YR	-0.19327	0.328132	0.06415	0.1122899	-0.11354	0.155339
YR OF REPO.	5.110087	-0.14091	-0.041	-0.135938	0.346184	-0.09243

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
79.1	155.200	0.93	N/A	N/A
79.2	148.364	0.82	N/A	9.908
79.3*	149.947	0.78	N/A	68.769
GROWTH RATE:				
PRIOR QTR	-0.04404	-0.11827	-	-
QTR OF REPO.	0.010669	-0.04878	-	5.9407549

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-44
CHELSA CORPORATION

S.I.C.: 163267
ANNOUNCEMENT DATE (T=0): 11/4/86
REPURCHASE ANNOUNCEMENT PERCENTAGE: 19.391%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
80	5.409	35.564	232.224	10.420	8.337	0.97
81	19.073	31.435	199.65	12.585	1.640	1.56
82	22.654	22.107	143.409	12.267	0.799	1.81
83	16.889	15.466	145.505	11.152	2.322	2.08
84	5.043	14.825	199.605	14.472	4.328	2.11
85	20.217	17.631	184.527	16.594	5.496	2.41
86*	22.111	19.642	179.510	13.849	11.445	2.70
GROWTH RATE:						
5 YR	0.30173	-0.13093	-0.0449	0.09753	-0.07995	0.199634
3 YR	-0.03722	-0.07263	0.0876	0.10596	0.90181	0.100135
2 YR	0.09410	0.06770	0.1261	0.21983	0.53848	0.076407
1 YR	3.00892	0.18927	-0.0755	0.14663	0.26987	0.142180
YR OF REPO.	0.09368	0.114060	-0.0271	-0.16542	1.08242	0.120331

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
86.2	45.646	0.53	N/A	11.805
86.3	47.002	0.86	N/A	16.063
86.4*	43.067	0.90	N/A	22.111
GROWTH RATE:				
PRIOR QTR	0.02970	0.622641	-	0.3606946
QTR OF REPO.	-0.08371	0.046511	-	0.3765174

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-45
CURTISS-WRIGHT

S.I.C.: 231561
ANNOUNCEMENT DATE (T=0): 01/02/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 12.0923%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	52.188	3.354	326.357	30.667	9.054	1.62
76	72.099	2.790	336.679	26.431	7.060	2.19
77	87.685	2.374	309.903	29.517	9.438	1.89
78	39.919	53.521	318.356	33.321	11.960	1.94
79	29.753	69.920	346.652	32.573	14.341	3.96
80	37.168	65.051	185.539	20.909	11.665	4.65
81*	114.399	35.278	194.929	17.459	11.398	10.62
GROWTH RATE:						
5 YR	-0.06562	0.80941	-0.10680	-0.07375	0.05198	0.23477
3 YR	-0.24881	2.01479	-0.15717	-0.10858	0.07317	0.34998
2 YR	-0.03507	0.10247	-0.23658	-0.20786	-0.01240	0.54819
1 YR	0.24922	-0.06963	-0.46476	-0.35811	-0.18659	0.17424
YR OF REPO.	2.077889	-0.45768	0.05061	-0.16500	-0.02288	1.283870

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
80.3	38.12	-0.11	4.812	32.017
80.4	58.45	1.52	5.127	37.168
81.1	49.10	5.26	2.218	134.572
GROWTH RATE:				
PRIOR QTR	0.53315	-14.8181	0.06546	0.1608832
QTR OF REPO.	-0.15989	2.4605	-0.56738	2.6206414

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-46
FUQUA INDUSTRIES

S.I.C.: 361028
ANNOUNCEMENT DATE (T=0): 10/14/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 19.3798%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	22.624	142.995	536.813	39.784	21.577	-2.11
76	24.640	129.571	535.851	55.569	26.300	1.51
77	16.533	154.429	631.733	66.711	35.191	1.71
78	60.351	262.294	1643.363	114.792	51.016	2.25
79	137.755	346.743	2056.823	212.085	71.017	4.87
80	120.624	265.092	1589.511	100.042	55.318	2.29
81*	38.490	215.312	706.744	58.489	20.967	-1.36
GROWTH RATE:						
5 YR	0.39757	0.13140	0.24248	0.202526	0.20719	-2.0165
3 YR	0.93952	0.19735	0.36012	0.144621	0.16273	0.1022
2 YR	0.41376	0.00532	-0.01652	-0.066454	0.04131	0.0088
1 YR	-0.12435	-0.23548	-0.22720	-0.528292	-0.22105	-0.5297
YR OF REPO.	-0.68090	-0.18778	-0.55537	-0.415354	-0.62097	-1.5938

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.2	184.780	0.15	0.0001	117.228
81.3	182.685	0.0001	0.0001	30.460
81.4*	175.365	-1.79	0.0001	38.490
GROWTH RATE:				
PRIOR QTR	-0.01133	-	0	-0.740164
QTR OF REPO.	-0.04006	-	0	0.2636244

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-47
GATX

S.I.C.: 361448
ANNOUNCEMENT DATE (T=0): 5/16/86
REPURCHASE ANNOUNCEMENT PERCENTAGE: 31.0979%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
80	25.99	1016.778	992.6709	273.4729	232.625	4.98
81	40.14	1289.185	1190.698	303.4929	265.061	5.16
82	59.2	1431.699	951.3999	256.8999	131.800	2.22
83	40.7	1281.199	848.5999	247.1000	69.000	-6.99
84	51.4	1257.899	847.2998	261.3997	64.900	2.43
85	51.2	1153.099	694.0999	260.0999	56.300	-0.07
86*	84.3	1233.399	512.3999	250.2999	57.000	2.18
GROWTH RATES:						
5 YR	0.1452	0.02548	-0.06905	-0.009977	-0.24704	-0.5738
3 YR	-0.0472	-0.06959	-0.09977	0.004134	-0.24687	-1.0135
2 YR	0.1216	-0.05130	-0.09560	0.025968	-0.09670	-0.8999
1 YR	-0.0039	-0.08331	-0.18080	-0.004972	-0.13251	-1.0288
YR OF REPO.	0.6465	0.06964	-0.26177	-0.037677	0.01243	-32.142

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
85.4	132.1	0.30	54.6	45.2
86.1	115.1	0.44	57.7	62.6
86.2*	126.7	0.41	58.5	14.8
GROWTH RATE:				
PRIOR QTR	-0.12869	0.46667	0.056776	0.384956
QTR OF REPO.	0.10078	-0.06818	0.013864	-0.763578

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-48
MORTON NORWICH (THIOKOL)

S.I.C.: 691426
ANNOUNCEMENT DATE (T=0): 7/27/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.7647%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	35.572	122.660	563.710	73.320	46.998	0.0001
77	71.015	121.272	609.303	78.9632	29.702	2.50
78	100.468	114.119	656.733	84.5831	29.139	2.83
79	95.595	109.970	731.984	95.8521	49.593	3.39
80	24.688	98.907	846.601	89.4570	53.416	3.51
81	47.232	98.935	957.584	106.6011	55.206	3.89
82*	307.058	69.085	786.976	97.6160	37.804	3.60
GROWTH RATE:						
5 YR	0.05834	-0.04207	0.11179	0.07773	0.032717	7.27923
3 YR	-0.22243	-0.04647	0.13396	0.08017	0.237382	0.11187
2 YR	-0.29708	-0.05149	0.14377	0.05458	0.055074	0.07121
1 YR	0.91316	0.00028	0.13109	0.19165	0.033510	0.10826
YR OF REPO.	5.50106	-0.30171	-0.17816	-0.08429	-0.31521	-0.07455

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
82.1	191.978	0.95	26.662	57.256
82.2	185.846	0.54	18.077	29.843
82.3*	221.091	1.26	33.196	92.871
GROWTH RATE:				
PRIOR QTR	-0.03194	-0.43157	-0.32199	-0.478779
QTR OF REPO.	0.189646	1.33333	0.83637	2.111986

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-49
SEAGRAM

S.I.C.: 811850
ANNOUNCEMENT DATE (T=0): 10/30/81
REPURCHASE ANNOUNCEMENT PERCENTAGE: 14.2514%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
75	49.732	471.900	1930.785	225.9246	131.908	2.11
76	133.287	595.591	2048.967	231.3420	143.206	2.30
77	61.716	515.798	2184.260	270.7439	106.609	2.48
78	51.848	512.064	2272.583	292.4402	174.955	2.58
79	25.002	421.098	1607.727	326.9648	182.962	4.79
80	18.351	460.016	1588.245	275.8262	118.102	1.73
81*	815.119	1217.746	1789.734	310.2986	140.341	9.42

GROWTH RATES:

5 YR	-0.18077	-0.00508	-0.03830	0.040721	-0.02186	-0.03893
3 YR	-0.33254	-0.03743	-0.10076	0.006218	0.03472	-0.11312
2 YR	-0.40507	-0.05218	-0.16401	-0.028821	-0.17839	-0.18113
1 YR	-0.26601	0.09242	-0.01211	-0.156403	-0.35449	-0.63883
YR OF REPO	43.41822	1.64718	0.12686	0.124979	0.18830	4.44509

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.2	505.7200	1.77	178.47	0.0001
81.3	396.4089	1.71	58.99	0.0001
81.4*	398.4099	3.08	72.84	815.1189

GROWTH RATE

PRIOR QTR:	-0.21614	-0.03389	-0.66947	-
QTR OF REPO:	0.00505	0.80117	0.23472	-

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-50
TANDY CORPORATION

S.I.C.: 875382
ANNOUNCEMENT DATE (T=0): 4/2/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 9.5878%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	35.778	237.215	1059.323	164.5583	52.779	5.50
79	37.621	230.733	1215.482	195.5483	29.492	3.23
80	56.365	228.698	1384.636	243.3962	33.628	4.47
81	141.994	126.331	1691.372	343.5789	50.757	1.65
82	167.547	143.308	2032.551	424.8740	69.898	2.17
83	279.743	138.420	2475.185	535.9597	74.876	2.67
84	154.655	347.548	2736.985	535.5789	81.676	2.75
GROWTH RATE:						
5 YR	0.50879	-0.10213	0.18499	0.266375	0.07245	-0.13457
3 YR	0.70575	-0.15411	0.21364	0.300986	0.30581	-0.15782
2 YR	0.40360	0.04675	0.20972	0.248972	0.21457	0.27208
1 YR	0.66964	-0.03410	0.21777	0.261456	0.07122	0.23041
YR OF REPO.	-0.44715	1.51082	0.10577	-0.00071	0.09082	0.02996

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
83.4	590.062	0.71	143.061	279.743
84.1	583.429	0.57	114.452	194.899
84.2*	898.266	0.98	196.967	296.554
GROWTH RATE:				
PRIOR QTR	-0.01124	-0.19718	-0.19997	-0.303292
QTR OF REPO.	0.53963	0.71930	0.72096	0.521578

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-51
TELEDYNE

S.I.C.: 879335
ANNOUNCEMENT DATE (T=0): 5/10/84
REPURCHASE ANNOUNCEMENT PERCENTAGE: 24.5443%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
78	262.648	261.695	2441.628	413.873	102.019	19.00
79	255.897	243.617	2705.599	458.3394	92.521	27.59
80	236.983	619.752	2926.417	481.3059	99.211	22.85
81	448.400	595.900	3237.600	578.3003	133.000	19.96
82	723.300	570.600	2863.799	441.7002	132.800	12.62
83	807.600	570.000	2979.000	386.9993	75.800	14.87
84*	198.000	1070.699	3494.299	407.2991	84.900	37.69
GROWTH RATE:						
5 YR	0.25189	0.16847	0.04059	-0.01334	-0.05768	-0.04783
3 YR	0.50485	-0.02750	0.00595	-0.07011	-0.08581	-0.13342
2 YR	0.34204	-0.02197	-0.04076	-0.18195	-0.24506	-0.13687
1 YR	0.11655	-0.00105	0.04023	-0.12384	-0.42921	0.17829
YR OF REPO.	-0.75482	0.8784	0.17298	0.05245	0.12005	1.53463

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
83.4	791.0999	4.37	N/A	807.5999
84.1	877.0989	1.74	N/A	865.0999
84.2	896.2000	20.65	N/A	448.3999
GROWTH RATE:				
PRIOR QTR	0.108708	-0.60183	N/A	0.071199
QTR OF REPO.	0.021777	10.86781	N/A	-0.481678

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-52
PHILLIPS VAN HEUSEN

S.I.C.: 718592
ANNOUNCEMENT DATE (T=0): 8/4/87
REPURCHASE ANNOUNCEMENT PERCENTAGE: 34.2775%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
81	6.145	50.567	431.1348	23.6109	4.105	2.37
82	7.312	41.469	454.9749	28.1531	5.892	2.87
83	16.917	26.798	505.8848	40.5148	7.015	2.77
84	11.694	51.474	590.7869	40.6800	8.562	2.44
85	22.712	20.238	550.4280	44.4151	5.256	2.53
85	26.267	8.815	514.3870	48.8491	5.763	3.18
87	22.621	120.848	500.0249	44.655	7.738	0.0001
GROWTH RATE:						
5 YR	0.3371	-0.29486	0.03594	0.156508	0.07021	0.060561
3 YR	0.1579	-0.30969	0.00557	0.064341	-0.06342	0.047086
2 YR	0.4987	-0.58617	-0.06689	0.095816	-0.17957	0.141612
1 YR	0.1565	-0.56443	-0.06547	0.099831	0.09646	0.256916
YR OF REPO.	-0.1388	12.70935	-0.02792	-0.085858	0.34270	-0.99996

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
87.1	77.392	0.53	7.117	18.377
87.2	86.185	0.19	7.418	153.521
87.3*	181.811	0.98	22.085	26.331
GROWTH RATE:				
PRIOR QTR	0.113616	-0.64150	0.042293	7.353975
QTR OF REPO.	1.109543	4.15789	1.977217	-0.828486

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-53
AMERICAN CAN

S.I.C. #: 02843
ANNOUNCEMENT DATE (T=0): 11/13/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 10.665%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	238.9	364.2	3142.499	306.000	112.1	5.01
77	194.2	360.4	3441.698	315.099	128.2	5.38
78	145.5	475.0	3981.000	337.700	188.3	5.92
79	90.4	493.4	4515.000	339.001	253.3	6.30
80	159.1	573.8	4812.199	258.798	240.6	4.26
81	172.8	562.6	4836.398	281.197	162.3	3.77
82*	103.7	622.1	4063.401	163.600	148.8	-7.31
GROWTH RATE:						
5 YR	-0.06272	0.09087	0.090057	-0.016763	0.07681	-0.0552
3 YR	0.05899	0.05804	0.067029	-0.059208	-0.04832	-0.1396
2 YR	0.38257	0.06783	0.034980	-0.089237	-0.19953	-0.2264
1 YR	0.08612	-0.01951	0.005028	0.086550	-0.32543	-0.1150
YR OF REPO.	-0.39988	0.10576	-0.15982	-0.418201	-0.08317	-2.9389

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
82.2	1170.200	0.53	56.3001	11.6
82.3	883.202	-8.48	24.2002	47.1
82.4*	917.900	0.04	26.7000	103.7
GROWTH RATE:				
PRIOR QTR	-0.24525	-17	-0.5702	3.0603
QTR OF REPO.	0.03929	-1.00471	0.1032	1.2017

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-54
AXIA

S.I.C.: 054595
ANNOUNCEMENT DATE (T=0): 7/22/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 7.4917%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	28.678	32.975	171.623	23.412	6.062	2.52
77	22.547	33.797	203.986	27.739	9.159	2.33
78	17.256	33.445	257.650	33.271	14.473	2.28
79	40.045	31.000	287.491	37.327	6.141	3.01
80	20.651	30.031	256.558	35.160	11.319	2.55
81	12.895	29.762	273.631	29.545	6.626	3.00
82	20.122	29.342	205.629	8.112	6.283	0.65
GROWTH RATE:						
5 YR	-0.14773	-0.02029	0.09778	0.047639	0.01795	0.03548
3 YR	-0.09254	-0.03814	0.02026	-0.038815	-0.22927	0.09579
2 YR	-0.43253	-0.02017	-0.02440	-0.110313	0.03873	-0.00166
1 YR	-0.37557	-0.00895	0.06654	-0.159692	-0.41461	0.17647
YR OF REPO.	0.56044	-0.01411	-0.24851	-0.725444	-0.05176	-0.78333

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.3	70.144	0.57	4.555	11.6
81.4	56.843	0.88	6.847	47.1
82.1*	59.624	0.32	7.313	103.7
GROWTH RATE:				
PRIOR QTR	-0.18962	0.54386	0.50318	3.060345
QTR OF REPO.	0.04892	-0.63636	0.06806	1.201699

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-55
BEATRICE

S.I.C.: 074077
ANNOUNCEMENT DATE (T=0): 12/30/83
REPURCHASE ANNOUNCEMENT PERCENTAGE: 10.079%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
77	186.289	303.962	6313.886	541.6787	197.083	2.35
78	163.394	679.142	7468.371	687.9834	350.924	2.51
79	209.781	659.271	8290.507	769.6875	303.167	2.67
80	417.528	691.438	8772.800	804.8655	276.219	2.79
81	224.814	759.041	9023.519	806.8008	469.063	2.87
82	264.300	772.400	9188.199	875.7996	467.500	0.27
83*	132.000	779.000	9327.000	897.0000	308.000	3.99
GROWTH RATE:						
5 YR	0.07246	0.20505	0.07792	0.100861	0.18857	-0.35127
3 YR	0.08005	0.05421	0.03486	0.043991	0.15531	-0.53410
2 YR	-0.20437	0.05693	0.02340	0.043135	0.30096	-0.68891
1 YR	0.17564	0.01760	0.01825	0.085521	-0.00333	-0.90592
YR OF REPO.	-0.50056	0.00854	0.015101	0.024207	-0.34117	13.77777

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
83.2	2231	0.78	231	
83.3	2456	1.25	250	3.794
83.4	2344	1.27	200	5.263
GROWTH RATE:				
PRIOR QTR	0.10085	0.60256	0.08225	-
QTR OF REPO.	-0.04560	0.016	-0.2	0.387190

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-56
LEVI-STRAUSS

S.I.C.: 527364
ANNOUNCEMENT DATE (T=0): 1/22/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 9.1496%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	15.940	48.110	653.042	53.515	28.895	1.09
74	23.737	72.236	897.696	99.014	24.334	3.20
75	76.939	68.728	1015.214	149.070	10.367	5.90
76	136.934	66.627	1219.740	217.376	18.520	4.71
77	160.941	80.647	1559.340	289.767	31.403	5.87
78	254.821	83.292	1682.017	295.169	42.863	6.56
79*	222.751	99.126	2103.108	347.984	68.956	9.16
GROWTH RATE:						
5 YR	0.74080	0.11602	0.208308	0.4070805	0.082061	0.431843
3 YR	0.49060	0.06616	0.183289	0.2557218	0.605005	0.035978
2 YR	0.36414	0.11808	0.174306	0.1652774	0.521320	0.180161
1 YR	0.58331	0.03279	0.078672	0.0186411	0.364933	0.117546
YR OF REPO.	-0.12585	0.19010	0.250348	0.1789322	0.608753	0.396341

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.3	397.6260	1.72	0	-
78.4	457.8500	1.82	0	3.794
79.1*	0.3976	1.87	0	5.263
GROWTH RATE:				
PRIOR QTR	0.151458	0.058139	0	-
QTR OF REPO.	-0.999130	0.027472	0	0.3871903

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-57
LONE STAR INDUSTRIES

S.I.C.: 542290
ANNOUNCEMENT DATE (T=0): 6/20/79
REPURCHASE ANNOUNCEMENT PERCENTAGE: 8.8978%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
73	9.863	136.142	682.740	74.6540	37.143	2.34
74	20.344	126.319	651.706	60.3070	46.765	2.04
75	20.178	162.396	611.461	49.3761	32.432	1.62
76	24.493	170.813	718.948	67.1261	39.815	2.25
77	21.995	216.105	861.324	82.0591	41.986	2.45
78	23.413	215.195	1091.814	109.1601	62.336	3.68
79*	19.304	207.143	792.5078	108.5161	122.140	4.73
GROWTH RATE:						
5 YR	0.18875	0.09589	0.09845	0.07895	0.10910	0.09478
3 YR	0.05082	0.09838	0.21318	0.30271	0.24334	0.31455
2 YR	-0.02229	0.12242	0.23233	0.27522	0.25126	0.27889
1 YR	0.06447	-0.00421	0.26760	0.33026	0.48469	0.50204
YR OF REPO.	-0.17550	-0.03741	-0.27413	-0.00589	0.95938	0.28533

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.4	175.034	0.71	20.282	23.413
79.1	146.536	-0.06	8.971	17.182
79.2*	195.832	1.33	30.240	32.524
GROWTH RATE:				
PRIOR QTR	-0.16281	-1.08450	-0.55768	-0.266134
QTR OF REPO.	0.336408	-23.1666	2.370861	0.892911

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-58
NORTHWEST INDUSTRIES

S.I.C.: 542290
ANNOUNCEMENT DATE (T=0): 1/15/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 19.7724%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	99.156	15.001	1568.9	230.0	91.9	3.53
77	55.100	23.262	1765.0	256.3	107.0	4.20
78	50.900	53.966	1983.3	286.6	167.6	4.90
79	32.700	66.391	2164.0	318.7	164.0	5.60
80	44.200	81.800	2422.2	326.0	141.3	5.03
81	36.800	-	3121.6	557.1	159.9	9.40
82*	22.000	-	2306.6	348.0	160.0	8.75
GROWTH RATE:						
5 YR	-0.17982	-	0.14751	0.19355	0.11714	0.21638
3 YR	-0.10248	-	0.16322	0.24801	-0.01555	0.24254
2 YR	0.06084	-	0.20105	0.32213	-0.01257	0.29559
1 YR	-0.16742	-	0.28875	0.70890	0.13163	0.86878
YR OF REPO.	-0.40217	-	-0.26108	-0.375336	0.00063	-0.06914

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
81.3	818.5	2.08	180.0	N/A
81.4	821.7	2.91	186.0	N/A
82.1*	794.4	4.10	196.3	N/A
GROWTH RATE:				
PRIOR QTR	0.00391	0.39904	0.03333	N/A
QTR OF REPO.	-0.03322	0.40893	0.05538	N/A

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-59
ROPER

S.I.C.: 776678
ANNOUNCEMENT DATE (T=0): 6/20/80
REPURCHASE ANNOUNCEMENT PERCENTAGE: 25.0409%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
74	16.599	38.109	336.1118	5.460	13.617	-2.14
75	10.698	34.228	317.4529	27.400	4.740	2.06
76	9.652	63.741	360.3669	35.277	7.095	4.45
77	6.511	63.170	0.0001	.0001	4.405	0.0001
78	9.489	62.414	432.9878	39.365	7.765	5.33
79	28.833	60.986	421.0649	34.006	8.685	1.92
80*	9.632	57.445	428.2529	23.401	11.510	1.29
GROWTH RATE:						
5 YR	0.1168	0.0986	0.04610	0.44169	-0.08601	-1.9785
3 YR	0.4402	-0.0146	0.05326	-0.01216	0.06973	-0.2444
2 YR	1.1044	-0.0174	2050.99	-	0.40414	-
1 YR	2.0386	-0.0229	-0.02753	-0.13614	0.11848	-0.6398
YR OF REPO.	-0.6659	-0.0581	0.01707	-0.31185	0.32493	-0.3281

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
79.4	116.002	0.76	0	28.833
80.1	78.264	0.20	0	20.293
80.2*	96.398	0.26	0	4.907
GROWTH RATE:				
PRIOR QTR	-0.32532	-0.73684	N/A	-0.296188
QTR OF REPO.	0.23170	0.30000	N/A	-0.758192

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

TABLE A-60
TESORO CORPORATION

S.I.C.: 881609
ANNOUNCEMENT DATE (T=0): 7/29/82
REPURCHASE ANNOUNCEMENT PERCENTAGE: 1.05542%

ANNUAL ANALYSIS:

YR	CASH	DEBT (L.T.)	NET SALES	OPERATING INCOME	CAPITAL EXPEND.	EPS
76	33.594	175.730	1070.101	85.9039	68.439	1.6
77	52.483	231.270	1175.734	55.9111	68.988	0.0001
78	52.436	196.735	1275.842	80.1090	32.730	1.5
79	56.921	141.581	2370.121	117.9109	35.551	2.84
80	32.236	16.243	3528.334	165.7415	85.603	4.94
81	17.927	14.608	3034.767	147.3370	107.113	3.82
82*	29.201	88.230	2439.852	153.3126	88.000	2.44
GROWTH RATE:						
5 YR	-0.11803	-0.39193	0.23180	0.113935	0.09372	0.19011
3 YR	-0.30076	-0.57969	0.33488	0.225209	0.48468	0.36560
2 YR	-0.43880	-0.67878	0.13156	0.117838	0.73578	0.15977
1 YR	-0.44388	-0.10065	-0.13988	-0.111043	0.25128	-0.22672
YR OF REPO.	0.62888	5.03984	-0.19603	0.040557	-0.17843	-0.36125

QUARTERLY ANALYSIS:

QTR	NET SALES	EPS	OPERATING INCOME	CASH
78.3	397.626	1.72	-	-
78.4	457.850	1.82	-	-
79.1	0.397	1.87	-	-
GROWTH RATE:				
PRIOR QTR	0.15146	0.058139		
QTR OF REPO.	-0.99913	0.027472		

*INDICATES PERIOD IN WHICH REPURCHASE ANNOUNCEMENT OCCURRED

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BIOGRAPHICAL SKETCH

Deborah L. Gunthorpe was born in Fort Lauderdale, Florida on June 5, 1955. She received a Bachelor's degree in Finance from the University of South Florida, Tampa, in December 1983. She has approximately thirteen years of business experience including ten years in the public utility industry, one year in the banking industry and two years in the legal profession. She expects to receive a Doctor of Philosophy degree in Finance from the University of Florida in August, 1990. She has accepted a position as assistant professor of finance at the University of Tennessee, Knoxville beginning August, 1990.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

H. Levy

Haim Levy, Chairman
Walter J. Matherly
Professor of Finance

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Roy Crum

Roy Crum
Professor of Finance,
Insurance, and Real Estate

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Miles Livingston

Miles Livingston
Associate Professor of
Finance, Insurance, and Real
Estate

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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David Denslow
Professor of Economics

This dissertation was submitted to the Graduate Faculty of the Department of Finance, Insurance, and Real Estate in the College of Business and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1990

Madelyn Lockhart

Dean, Graduate School